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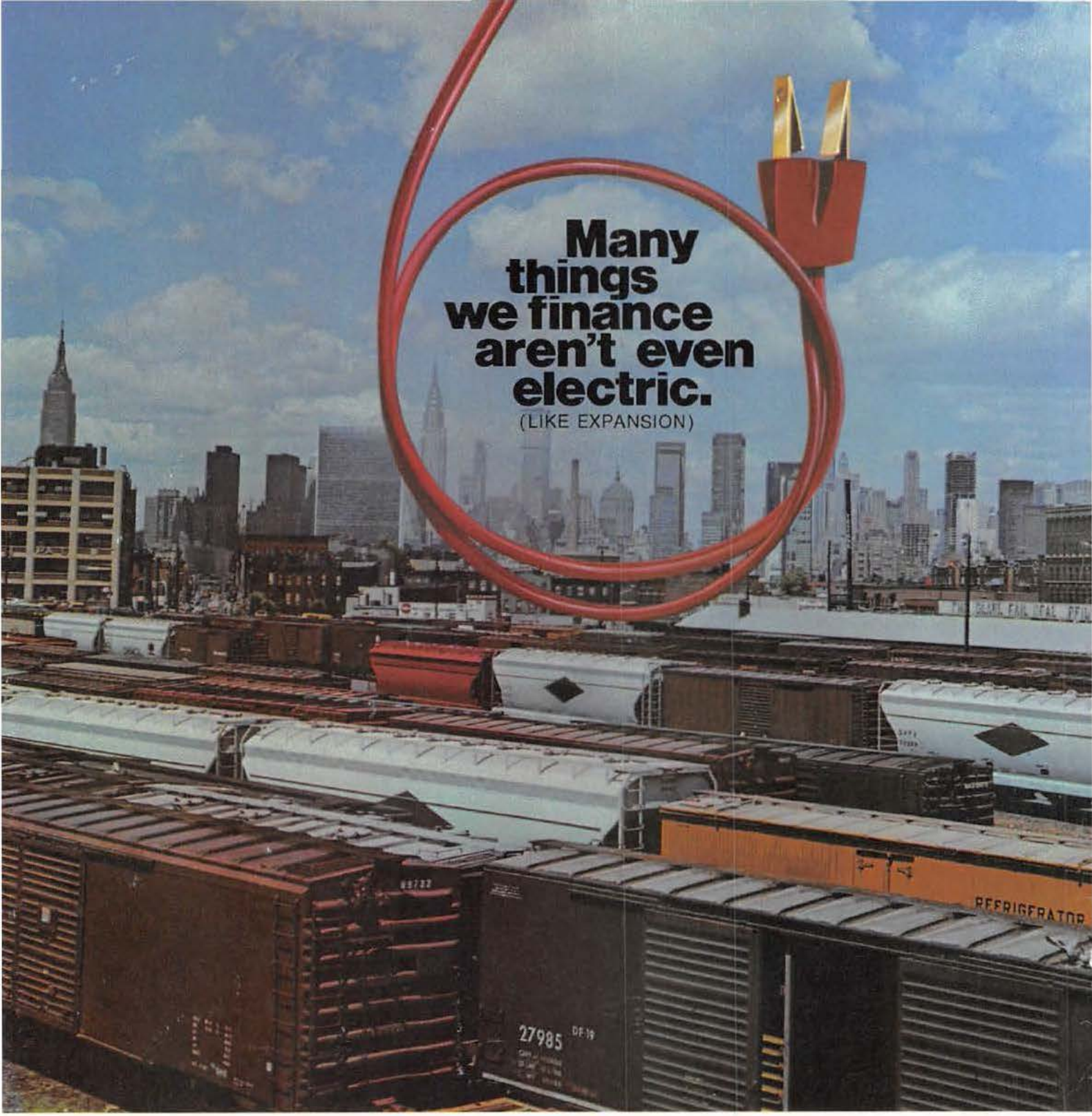

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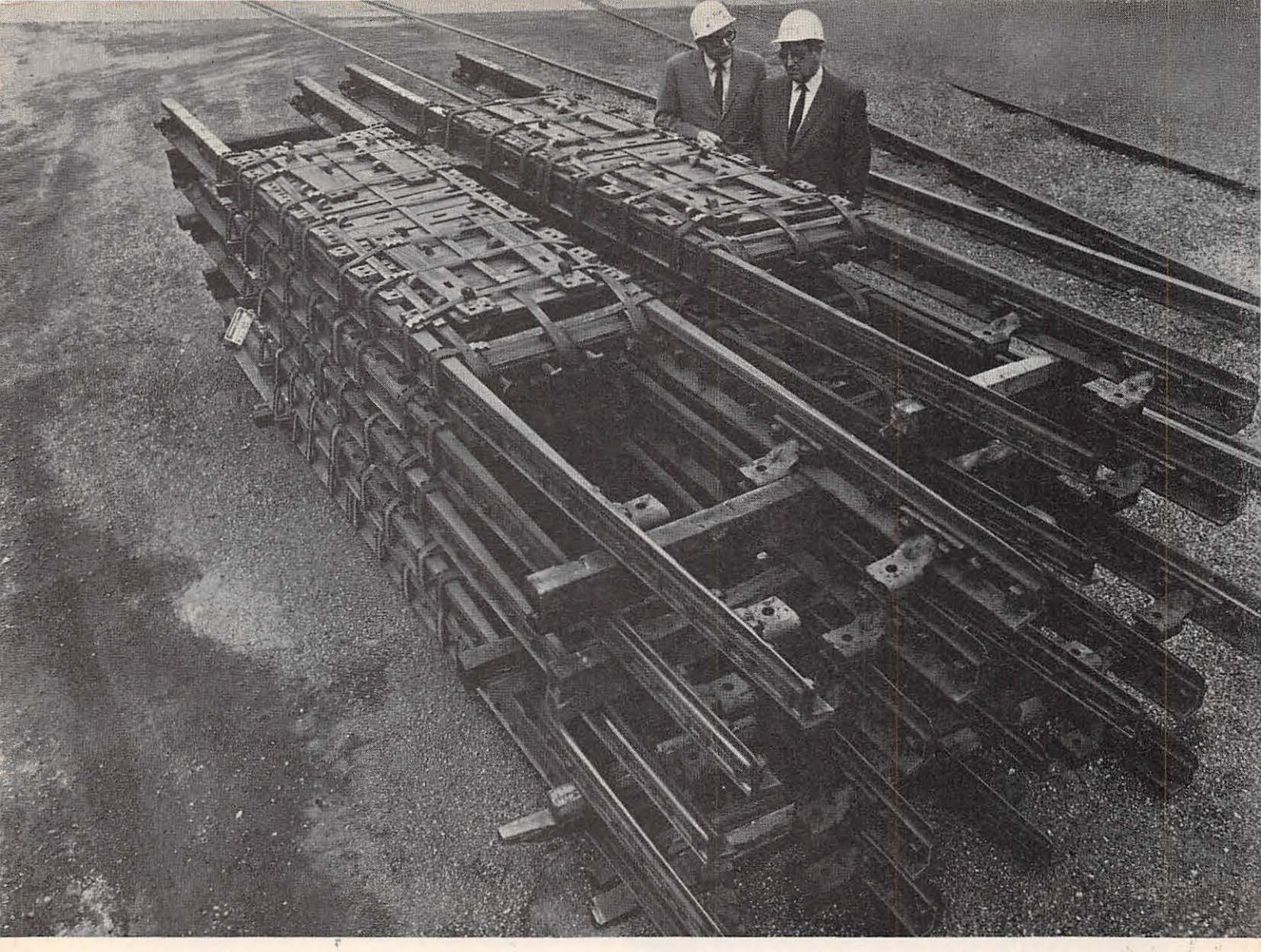

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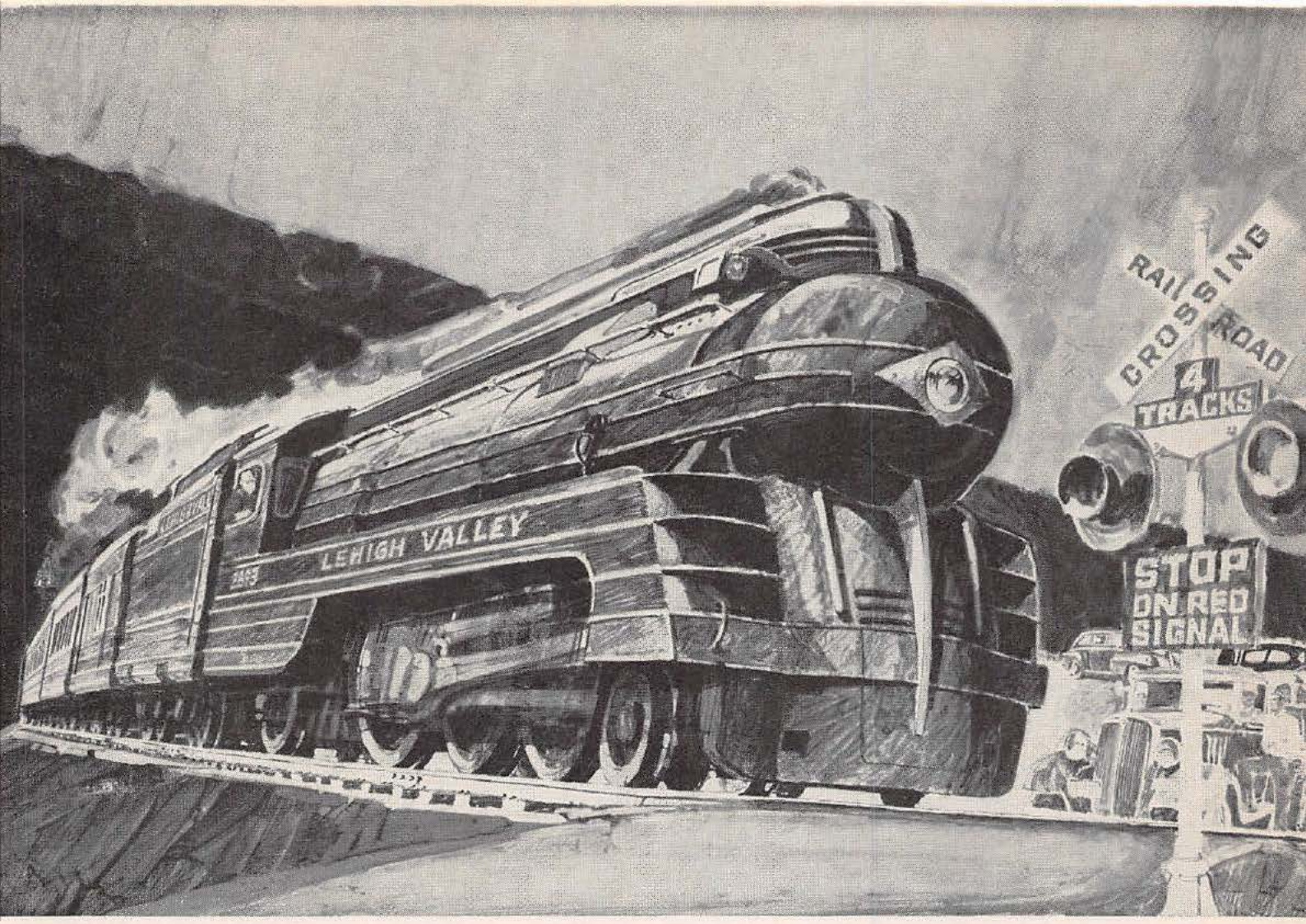

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Inside

LUTHER MILLER

ON RIGHT-OF-WAY TAKEOVER

ICC Vice Chairman W.D. Brewer recently observed that many of the interstate highways were being completed in 1966, thereby lowering the operating costs of truckers while increasing their competitive range. And he added: "Perhaps it is no coincidence that 1966 was the last generally good year for the railroad industry."

Many have long felt, like Mr. Brewer, that the competitive scales which Federal highway outlays now tip so heavily in favor of motor carriers must somehow be balanced. One proposal gaining increasing support in Washington is that the Federal government take over railroad rights-of-way and maintain an interstate railroad system much as it now maintains highways and airways (p. 10). But is this really the best way to wipe out an iniquitous inequity? We think not (p. 54).

KUDOS FOR MERWIN DICK

It was eight months ago that tropical storm Agnes hit northeastern railroads with savage floods. The mud was still not dry on the roadbeds when Engineering Editor Merwin Dick's detailed, five-page story on the disaster, and its dire implications for a segment of the railroad industry already in deep trouble, was rolling on Railway Age's presses.

Senator Hugh Scott (R.-Pa.), the Republican minority leader, was sufficiently impressed with Merwin's story that he used it in his efforts to persuade Congress to approve emergency aid for the flood-struck roads. (He succeeded.)

Also impressed were the judges of the Jesse H. Neal Editorial Achievement Awards—the "Pulitzer Prizes" of the business press, given annually by the American Business Press, Inc. to honor ABP's first managing director.

Out of 405 articles nominated, the judges picked 27 as winners including Merwin Dick's "Agnes: The Agony and the Aftermath" (RA, Aug. 14, 1972). A photograph of the Certificate of Merit presented to Merwin is reproduced above—along with a picture of the winner who, in addition to serving as engineering editor of Railway Age, is editor-in-chief of Railway Track & Structures.

The criteria for the awards: journalistic enterprise, extent of service to the field served and editorial craftsmanship.

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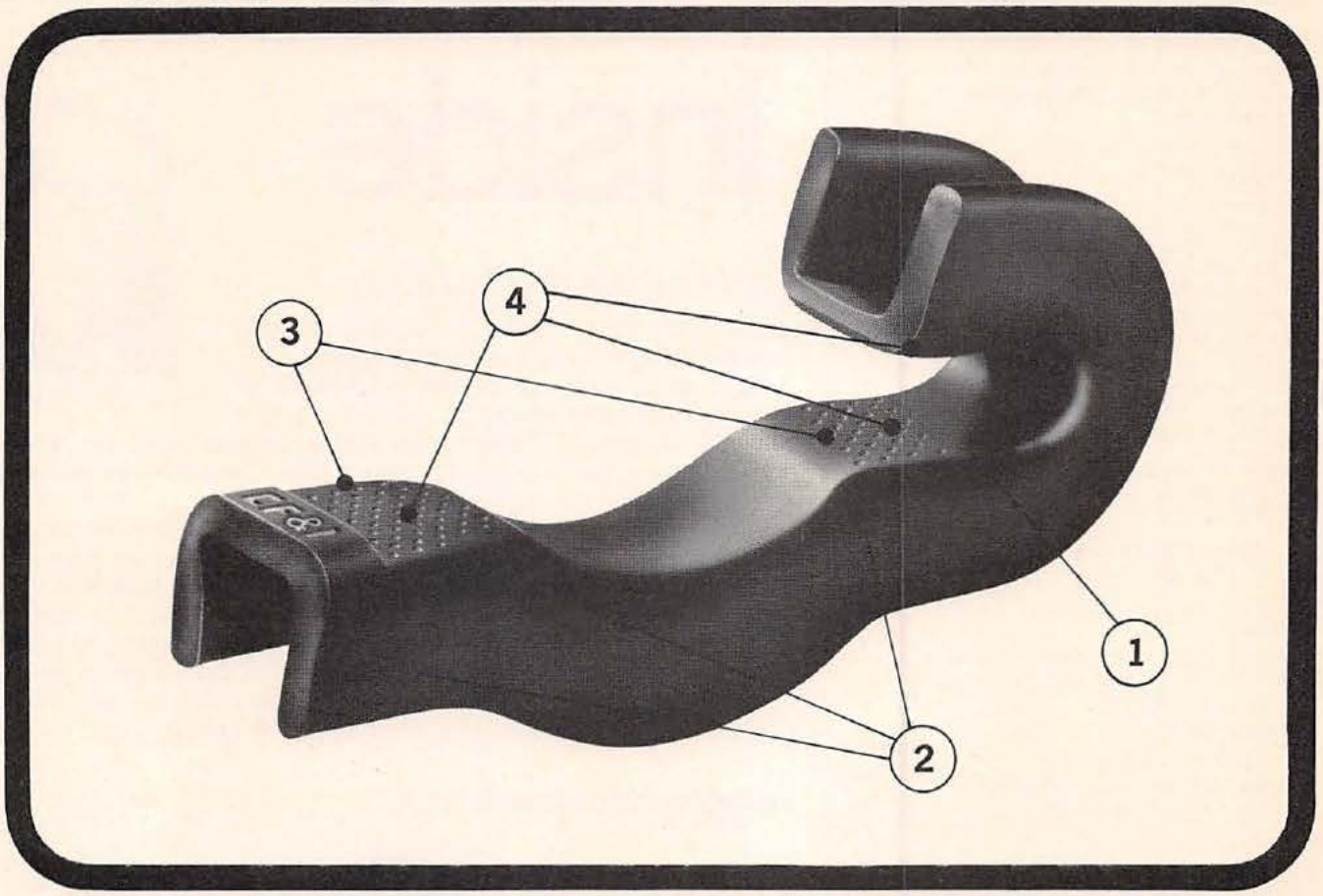

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Circle 5 on coupon page 45

RAILWAY AGE

MARCH 12, 1973

FEATURES

The search for M/W answers:

Engineers pose problems, propose solutions ..... p. 18

Concrete ties for more durable track? ..... p. 22

Transit

Boeing: Streetcars from a 'copter plant? ..... p. 33

Washington Metro: The excitement begins to build ..... p. 34

"The railroad will come roaring back," says Sen. Weicker ..... p. 40

NEWS

Shippers are still cool toward STA ..... p. 8

Car orders at record pace for builders ..... p. 8

Grade-crossing inventory begins ..... p. 8

Railroads and unions are making progress ..... p. 8

UP boosts its 1973 capital spending ..... p. 8

Milwaukee Road enters Louisville ..... p. 8

Hartke: A plan for takeover of rights-of-way ..... p. 10

FRA buys Krauss-Maffei maglev data ..... p. 13

Milwaukee Road is ending its electric operations .... p. 13

Ingram, Kenefick address engineering sessions ..... p. 13

Highway Trust-fund diversion heads for a showdown . p. 16

Baltimore transit's new target date: 1980 ..... p. 50

Capital grant requests pile up at UMTA ..... p. 50

Transit gets its own subcommittee in the House ..... p. 50

Paris plans a Transport-Expo for June 4-8 ..... p. 50

Engineering test program for SOAC vehicles ..... p. 50

SEPTA requests funds to resume helicopter patrol ... p. 50

Toronto subway ridership continues to increase ..... p. 50

OPINION

INSIDE — On the plan for a right-of-way takeover ..... p. 5

LINES ON LABOR — The task of writing a job description ..... p. 16

VIEWPOINT — Let's keep our rights-of-way ..... p. 54

WATCHING WASHINGTON — No light shed on Penn Central solution ..... p. 14

COVER

The photograph of a steel gang near Vaughn, N.M., was taken by R. Collins Bradley, Santa Fe system photographer at Los Angeles.

DEPARTMENTS

Advertising Sales Offices ..... p. 53

Carloadings ..... p. 49

Market Outlook ..... p. 49

Moving People ..... p. 50

New Products ..... p. 45

Piggyback Loadings ..... p. 49

Supply Trade ..... p. 52

Transit Personnel ..... p. 52

Short and Significant

SHIPPERS STILL COOL TO STA

Efforts to win broad shipper support for the carrier-backed version of the proposed Surface Transportation Act have apparently failed. The rail, motor and water carriers supporting STA as it emerged in H.R. 16281 in the 92nd Congress want the bill to be reconsidered by the 93rd in essentially that form, pointing out that it is the product of long months of negotiation and compromise and that tampering with it could well jeopardize approval of any legislation this year. More controversial proposals not now included in STA should be considered as separate measures, these backers say. But the National Industrial Traffic League, in a position paper sent to key Congressional committees, says it still wants changes. NITL, for example, is pushing for freer entry into trucking—a provision which would probably cause regulated truckers to back away from the bill. NITL also said it opposes "the section [of H.R. 16281] relating to development and implementation of interim rate adjustments and the section relating to report filing and rate publication extension to water transport of dry bulk commodities." Omission of the latter item, it is felt, could cost STA the support of the regulated water carriers. But observers point out that there is still time for negotiation since, as one put it, "STA is not on the front burner right now, and won't be until some more urgent problems, like that of Penn Central, are resolved."

GRADE-CROSSING INVENTORY BEGINS

The National Grade Crossing Inventory and Numbering Project, which will gather data on an estimated 223,000 crossings, officially got under way in Alexandria, Va., March 7. FRA Administrator John W. Ingram was joined by acting Highway Administrator Ralph R. Bartelsmeyer, AAR President Stephen Ailes and Southern President W. Graham Claytor, Jr., in a ceremonial numbering of the first crossing (at a point where Southern tracks and South Van Dorn St. intersect). The information will eventually be put on computers and used as the basis for planning, implementing and evaluating Federal, state and local grade-crossing improvements. The $2.55-million project is jointly funded by the FRA and the railroads.

MILWAUKEE ROAD ENTERS LOUISVILLE

One of the nation's longest single-line railroad hauls—2,686 miles between Portland, Ore., and Louisville, Ky.—came into existence March 1. It was born following a three-judge court decision in Louisville that enabled the Milwaukee Road to use trackage rights over Louisville & Nashville and Kentucky & Indiana Terminal between Bedford, Ind., and Louisville. Importantly, the 75-mile leg gives the Milwaukee Road connections with the Southern and access to traffic moving in and out of the South and Southeast. Before the court decision was rendered, Milwaukee Road's deepest penetration into southern Indiana was Bedford. The road's entry into Louisville was one of the conditions of ICC's approval of the L&N-Monon merger completed July 31, 1971.

CAR ORDERS AT RECORD PACE FOR BUILDERS

January represented the best month for orders for carbuilders in seven years. According to AAR/ARCI totals, 5,084 new freight cars were ordered from commercial shops in January 1973. This made the undelivered backlog of 22,283 on Feb. 1, 1973, higher than at any time during 1972. While railroad-owned shops loomed larger in order totals in the past, the January record for commercial shops was 5,749 in 1966 (details on page 49).

RAILROADS, UNIONS MAKING PROGRESS

The railroad retirement system is already one of the most complex pension plans anywhere, and restructuring it is no easy task. But railroad and union representatives have told overseeing Congressional committees that they have made "substantial progress" toward shaping recommendations for the system that both sides can support. Management and labor have held a number of meetings on the problem since the Federally-created Commission on Railroad Retirement issued its report in mid-1972.

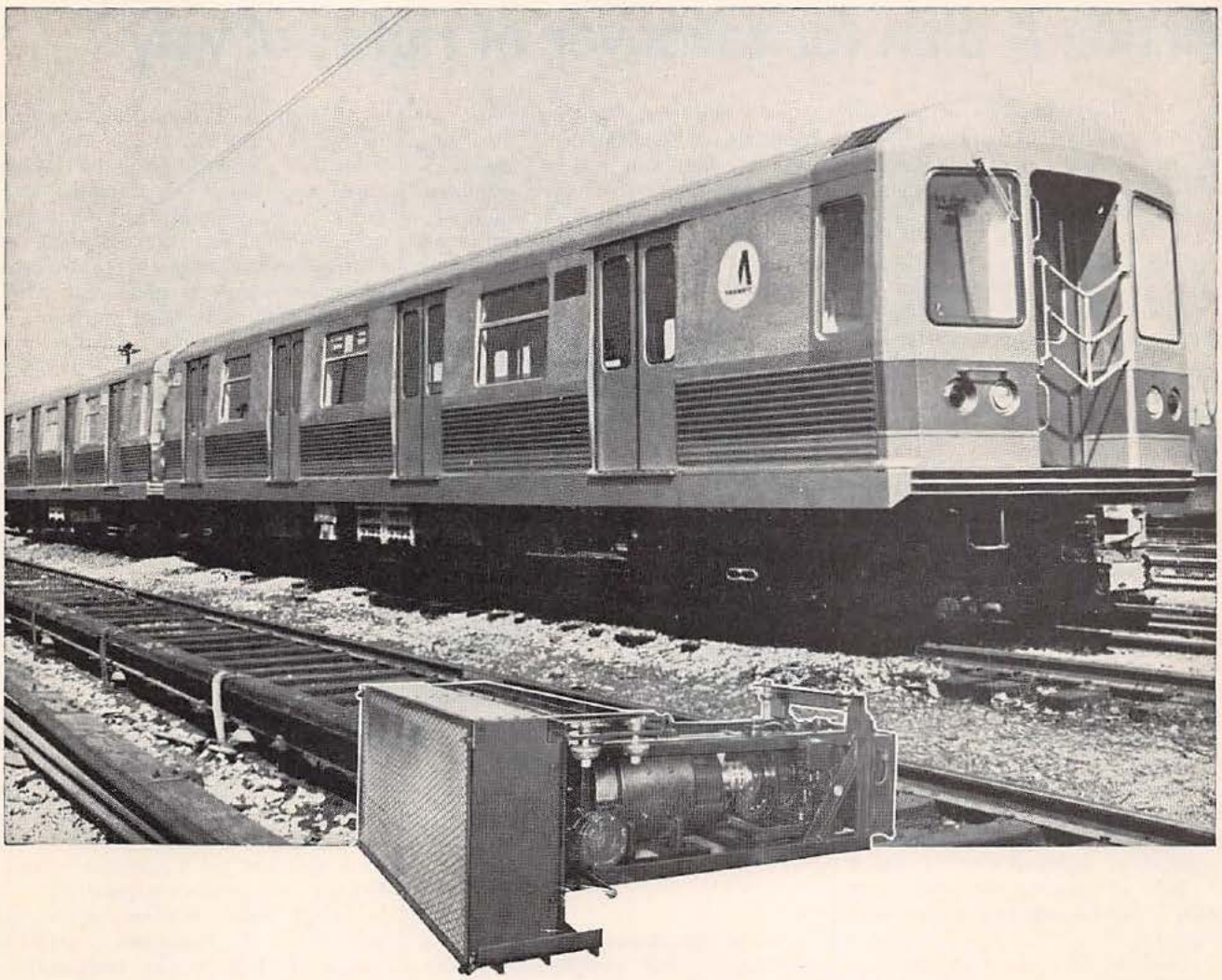
UP BOOSTS 1973 CAPITAL SPENDING

Add Union Pacific to the lengthening list of railroads that will be acquiring more equipment in 1973 than originally planned. UP's equipment investment for the year now will stand at $139 million—with new orders for 20 3,000-hp diesel-electric units divided between EMD and GE and for 600 100-ton covered hopper cars from Pullman-Standard. UP's initial budget called for acquisition of 60 locomotive units and 400 covered hopper cars. The value of the new orders: About $19 million.

PLANT LOCATION AT NEW HIGH ON NW

The year 1972 was the most successful in history for Norfolk & Western plant locators. Decisions were reached to construct 141 new plants along the road's 7,600-mile system—topping the previous one-year high of 126 new facilities in 1966. In addition, 52 existing plants served by NW are expanding.

"Safety" air conditioning: the system of the 70's



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RAILWAY AGE
NEWS

Hartke: A plan for takeover of rights-of-way

Talk of Federal takeover of railroad rights-of-way, short of nationalization, is not new. What is new is a specific, broadly-backed proposal for such a takeover, spelling out precisely how it could be accomplished. S. 1031, submitted by Senator Vance Hartke (D.-Ind.) at the end of February and co-sponsored by a half dozen Northeast Corridor senators, proposes a federally-funded network of interstate rail lines similar to the Federal highway network. A similar bill was introduced in the House of Representatives by Rep. Brock Adams (D.-Wash.).

A national "Interstate Railroad System," not unlike the Federal highway system, would be designated and would become eligible for Federal assistance. "Less than $300 million annually is spent for railway transportation," explained Hartke in emphasizing the similarity of his plan to present Federal participation in highway, waterway and airway development. He added that $1.5 billion is spent yearly on aviation; $500 million is allocated to the merchant marine and approximately $21 billion in Federal and state money is spent on highways. "Rails are the only transportation rights-of-way to which the Federal government has not addressed its considerable resources," said Hartke.

S. 1031 would require the designation by the Secretary of Transportation of an interstate railroad system, identifying mainlines in the U.S. which would be upgraded to insure dependable operation of freight trains at 60 mph and passenger trains at 80 mph. Its other provisions:

—Require the Secretary of Transportation to provide within two years a report on the long-term capital needs for railroads.

—Provide for creation of a Northeast Rail Line Corp., a non-profit entity with 13 board members appointed by the President and states, railroads, Amtrak, rail labor and shippers.

—Require that within six months Northeast Rail acquire track and roadbed, exclusive of yards and terminals, of the bankrupt Northeastern railroads in exchange for debentures equivalent to the liquidation value of the properties; lines of other Northeastern carriers would also be acquired.

—Provide that Northeast Rail rehabilitate and maintain all its lines, including branches, and be responsible for operation of signaling and communications; individual railroads would continue to operate their own trains and Amtrak would continue its passenger services over the tracks.

Railway Age photo by M. Mates

"Rails are the only transportation rights-of-way to which the Federal government has not addressed its considerable resources."

—Senator Vance Hartke

—Line abandonments would be in accordance with existing procedures, including ICC approval and with an opportunity for areas or agencies involved to retain the facilities by paying off half the maintenance and rehabilitation costs.

—Require substantial protection for employees.

—Require payment of user charges by railroads or Amtrak on a 60 cents per thousand gross ton miles basis (a cost figure based on expenditures by "healthier railroads").

—Authorize $50 million for organization of the Corporation; $300 million for line rehabilitation in each of the first two years; $100 million annually for maintenance and capital improvements; $1 billion of Federal guarantees for debentures for acquisition of railroad facilities and $200 million in loan guarantees for all "qualified" railroads for track and roadbed improvements to meed Federal standards.

As Senator Hartke opened hearings of the Surface Transportation Subcommittee on the Northeast rail crisis, Francis W. Sargent, govenor of Massachusetts, offered a proposal for a federally funded network of interstate rail lines much like that in S. 1031. "We can choose to continue our subsidies of a system which is inefficient and is providing poor service, or we can choose to break with the past and develop an existing railway system. I hope we choose the second course," the governor concluded.

Robert D. Timpany, Jersey Central trustee, suggested that a federal takeover in the Northeast would simply impose new burdens on taxpayers.

Whatever the fate of the Hartke bill, there are increasing pressures on Congress to do something—and do something quickly—about the northeastern railroad situation. Two developments on March 6 emphasized the deepening gravity of the crisis.

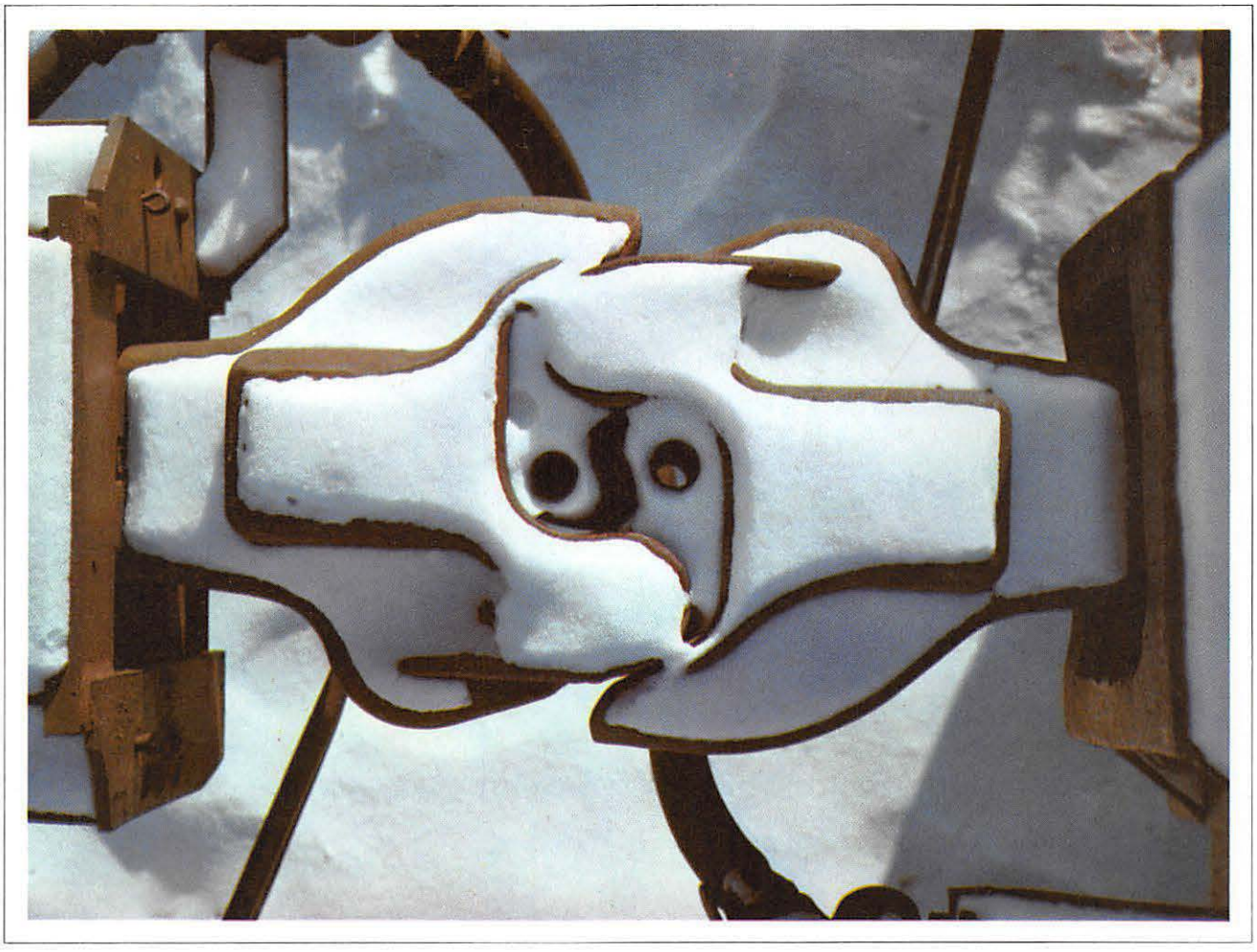
Declaring that it was doubtful that Penn Central could continue to operate on its present basis beyond Oct. 1, Judge John P. Fullam on March 6 gave the trustees until July 2 to come up with either a workable organization plan or a proposal for liquidation. April 1 had been the previous target date.

Lehigh Valley Trustees John F. Nash and Robert C. Haldeman, meanwhile, told Judge Fullman that reorganization of LV will be impossible without "substantial Federal assistance," and asked for permission to cease all operations by Oct. 1.

Judge Fullman's Penn Central action came following an announcement by the road's trustees that PC's January loss, on a fully accrued basis, amounted to $23.1 million, compared with $27.6 million in January 1972. (Just a few days earlier Penn Central reported a net loss of $197,902,649 for all of 1972, an improvement of 30.4% from 1971's loss of $248,520,523.)

The judge said he was not ruling out the possibility that PC can become viable; but, he said, he doubted this could be accomplished without massive financial aid.

Various kinds of aid are now being considered by the Administration, which has been asked by Congress to come up with proposals for the northeastern carriers by mid-April.



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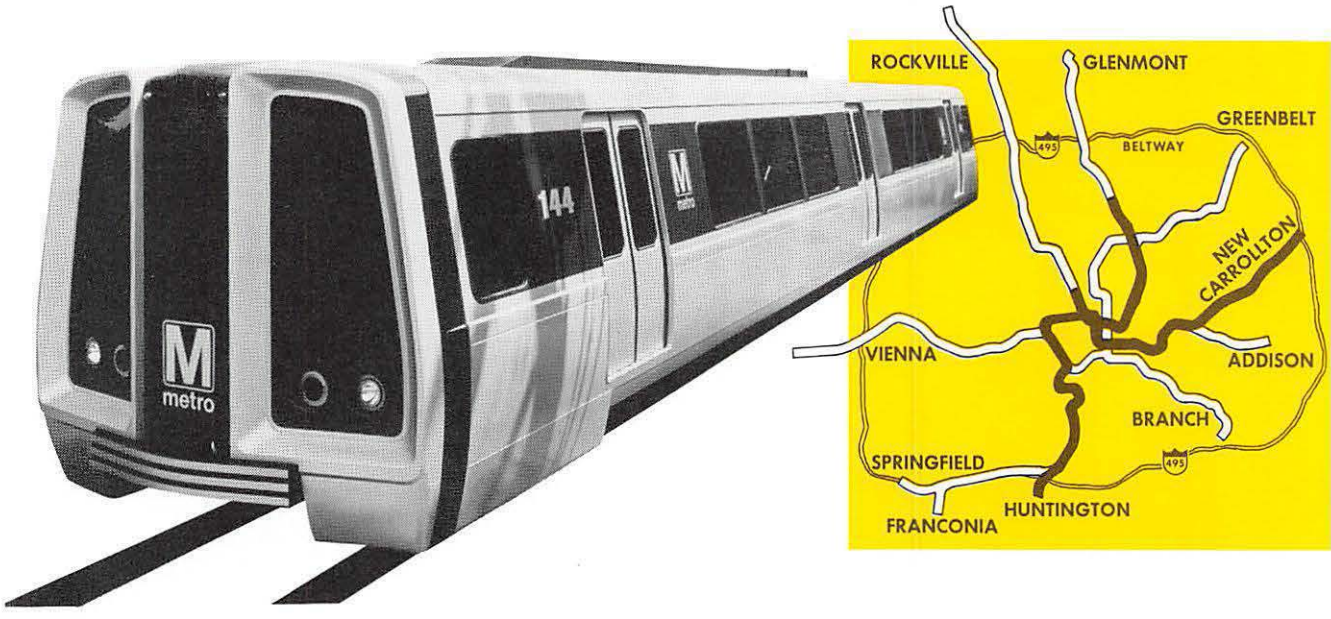

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FRA buys Krauss-Maffei maglev data

"New technology" buffs had their ups and downs recently due to two almost simultaneous announcements.

The first was a step forward for maglev (magnetic levitation vehicles) proponents. Krauss-Maffei, a German company which has been developing the Transrapid system, signed a $20,000 contract with the FRA to supply detailed technical information to the United States.

Magnetic levitation research in the U.S. has concentrated on the use of "repulsion" magnetic forces—the vehicle is suspended by being magnetically repelled from the metallic guideway.

The Krauss-Maffei system, on the other hand, uses "attraction" magnetic forces to suspend the vehicle above the metal guideway. Both systems use the linear induction motor for propulsion.

Since October 1971, an experimental test vehicle has been operating at Munich at speeds up to 100 mph. Krauss-Maffei anticipates an advanced version of the vehicle will operate on a new 1.5-mile track, to be completed this year, at speeds approaching 220 mph.

Information and data will be supplied concerning acceleration, vehicle motion, energy consumption, electromagnetic interference, failure mechanisms and guideway construction and costs.

For those on the TACV track, the news from Britain was not quite so heartening. Writing off four and one-half years of research and $12 million in development costs, Michael Haseltine, Minister of Aerospace and Shipping, announced the suspension of the Hovertrain project.

The Hovertrain, like the French Aerotrain, is a tracked air-cushion vehicle which rides on a concrete guideway. The TACV travels on a thin layer of compressed air driven downward by large fans. In announcing the decision, Haseltine pointed to Britain's APT (Advanced Passenger Train) as a primary reason for cancellation of the project.

Haseltine pointed out that discontinuance was "not because it had failed technically, but because we cannot see a use for it in Britain."

If the Hovertrain were expanded throughout Britain, the estimated costs for constructing the guideways, in a country with an already dense network of rail, would run about $2.5 million per mile. The APT, which has cost $25 million so far, on the other hand, is expected to be ready for full scale service by 1980 at a fraction of the cost.

Despite the fanfare for the new high-speed trains, whether maglev or TACV, the United States is moving slowly, with almost all of its eggs thrown into the TACV developmental area.

The Administration recently announced its intentions to take a more skeptical attitude toward such exotic transportation systems. While development will continue on such projects as the Rohr and Grumman TACVs, the Rohr maglev, AiResearch linear induction motor and some work with PRT (Personal Rapid Transit), everybody seems to want to take a second look at many things now in the works. They are looking for results—practical benefits—and not just theory that looks exotic and pretty on paper.

Milwaukee ending electric operations

Phase-out of Milwaukee Road's remaining electrified operations will take some time—but the decision has been made to go to a 100% dieselized operation (RA, Feb. 26, p. 22). Reason: Economics. As Chairman William J. Quinn and President Worthington L. Smith put it, "From a dollars-and-cents point of view, the railroad had no alternative."

Milwaukee's electrification consists of 440 miles between Harlowton, Mont., and Avery, ida., and 216 miles between Othello and Seattle/Tacoma—with a 212-mile segment of non-electrified line between the two stretches of electrified line. Continuation of electrified operation on a long-term basis, Quinn and Smith pointed out, "would mean not only electrifying the gap but also replacing the entire complex with a modern, high-voltage system and purchasing new electric locomotives. In effect, it would be like electrifying from scratch, and our studies indicated that such an undertaking would be unwise."

Actually, Milwaukee has been winding down its electrified operations for some time. The Othello-Seattle/Tacoma line has been operated with diesel-electric power for more than a year. Use of electric locomotives on the Harlowton-Avery line has been confined largely to operation on secondary trains and in helper service. Now, less than 20% of the locomotive-miles operated on the Harlowton-Avery line and only 3% of system locomotive-miles are run with straight-electric units.

Ingram, Kenefick on AREA program

Federal Railroad Administrator John W. Ingram and Union Pacific President John C. Kenefick will be the headliners at the annual meetings of the American Railway Engineering Association and the AAR Engineering Division March 19-21 in Chicago. Ingram will lead off the meeting Monday morning, March 19; Kenefick will be the speaker at the AREA/AAR annual luncheon on the following day.

Among other highlights of the two-and-a-half-day program:

—Discussion of the impact of FRA's revised track standards, by Illinois Central Gulf's Allen A. Sams.

—An outline of what the 1972 Pollution Control Act means in the context of railroad operations, by J.R. Coxey, assistant to the vice president and manager of AAR's environmental studies group.

—A rundown on programs and projects of the AAR Research Center by six members of the Center's staff.

—Discussion of engineering and maintenance practices on European railroads by Missouri Pacific's John G. German, ICG's George Pipas and Santa Fe's William S. Autrey.

—Discussion of applications of minicomputers to railroad engineering problems.

—Comments by R. Rex Manion, vice president of AAR's Operations and Maintenance Department; Dr. William J. Harris, Jr., AAR vice president, Research and Test Department; and Milton Klein, associate director-research at FRA.

Watching Washington

REID BEDDOW

TOWER OF BABEL

Penn Central and its problems continue to agitate this city, but it must be said that no great light has yet been shed on a solution. DOT Secretary Claude S. Brinegar publicly said Feb. 26 at a Transportation Association of America forum that DOT's forthcoming plan (due March 26) "would not solve" the carrier's difficulty, but would lead it "out of a blind alley." Most likely, this means Administration-sponsored bills to speed abandonments and effect employee layoffs, but how such legislation could get through a pro-labor, Democratic Congress was not elucidated. Meanwhile, Sen. Lowell Weicker (R.-Conn.) and Sen. Vance Hartke (D.-Ind.), chairman of the Senate Surface Transportation Subcommittee, on Feb. 27 introduced a bill (S. 1031) that would have the U.S. buy PC's rights of way, pay healthy rails to upgrade main line, and create a quasi-public "Northeast Rail Line Corporation" with $1 billion in loan guarantees for purchase of PC and other bankrupt rail right of way. This conceivably could pass Congress, albeit narrowly in the House, and almost certainly would face a Presidential veto that Congress would be unable to override. The Hartke-Weicker bill came on the eve of Senate Transportation Subcommittee hearings Feb. 28 and March 2 at which various nostrums were offered. R.D. Timpany, trustee of the Central of New Jersey, urged simply that PC be shut down. Frederic C. Dumaine, president of Amoskeag Co., parent of the Bangor & Aroostook and Maine Central, said PC should be divided between C&O/B&O and N&W. These suggestions stirred even Sen. Hartke: "I am discouraged by such oversimplified and negative testimony," he demurred. A gaggle of governors had other suggestions: Sargent of Massachusetts supported the quasi-government corporation approach, Cahill of New Jersey wanted consolidation of rails within his state, and Shapp of Pennsylvania urged PC be broken into two or four separate carriers. Paul W. Cherington, chief officer of the bankrupt Boston & Maine, however, came through loud and clear: "Nationalization or partial nationalization," he said, "would be a bonanza for unions. . .since most present jobs would become 'locked in'. . .and a partial bonanza for creditors, New York banks and large insurance companies. . .but a disaster for the U.S. taxpayer."

STIRRINGS AT ICC

ICC finally popped a surprise, confirming on March 1 that it had retained former Sen. Gordon Allott (R.-Colo.) as special counsel of its ongoing Ex Parte 270 investigation of the railroad freight rate structure. Allott, respected for his fairness and broad interest in transportation as a senator, was defeated in the November election.

The White House on March 2 announced the nomination of A. Daniel O'Neal, transportation counsel of the Senate Commerce Committee, to ICC membership. Even critics of O'Neal, and they are scarce, acknowledge that he will infuse badly-needed new blood into ICC. He is, in fact, the first ICC member in years with an intimate knowledge of rails, derived from his direction of the Senate Commerce Committee's lengthy investigation of PC and other rail problems.

Why 19

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Technological developments such as better lubricants, improved bearing designs and lubricator pads have all been employed by railroad managements to help solve the problem. Another significant step taken has been the increasing use of roller bearings. While these advances have helped, they have also made traditional methods of journal box inspection extremely difficult. The smoking oil fire indicating a friction bearing hot box is now a rare occurrence. A roller bearing that is about to fail seldom gives a warning sign that can be seen by eye. An automatic method for detecting hot boxes has become a necessity. The SERVOSAFE® Hot Box Detective™ System meets today's needs by providing for the automatic location of bearings that are running hot, so that action can be taken promptly after detection.

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Lines on Labor

GUS WELTY

WHAT DO YOU DO, DADDY?

Regardless of what line of work you're in, one of the toughest assignments a wage-slave can be given is this seemingly-simple one: Write your job description. In other words, what do you do? What is somebody paying yor for? Why are you taking up space? What benefit are you providing to the enterprise? Well, if you're a locomotive engineer, rest easier: McDonnell-Douglas has written your job description, in a report entitled, "Railroad Engineman Task and Skill Study," done under contract to DOT/FRA. This particular paper is not a standard, specification or regulation—though operating-practice standards will be a concern of FRA just as track and equipment standards have been. What this paper is, in McDonnell-Douglas' words, is a description of "the principal tasks performed by a locomotive engineman during over-the-road freight operations utilizing diesel-electric locomotive equipment. Sixty-four basic tasks are identified and classified into seven task groupings. Each step is described in terms of input to the engineman. . .information-processing and decision-making by the engineman, the output of the engineman. . .feedback of action consequences to the engineman and interactions with other crew members." Each of these tasks is rated for difficulty, hazard, and criticality for safe operation. As McDonnell-Douglas puts it, the report "is intended to provide data in support of further efforts toward relating the engineman's skill requirements—aptitudes, proficiency, training—and working environment to the safety of railroad operations."

GETTING DOWN TO BASICS—REAL BASICS

What an over-the-road freight engineman does, as McDonnell-Douglas divides things up, can be summarized in these categories: Basic handling tasks, pre-run preparation tasks, starting-off tasks, over-the-road tasks, terminating tasks, operating difficulty and malfunction tasks, and auxiliary-equipment operating tasks. For the most part, the task/skill study is pretty straight forward—though at a couple of points you get the impression that somebody was looking awfully hard for tasks. For instance, one of the "tasks" comes under the heading "use of locomotive cab heater." The input (stimulus) is "engineman is cold." In the information processing or decision-making column, the report says "engineman feels that the use of the cab heater is necessary." The output columns tell what the engineman does to make the heater work. And then there's the feedback (results) column: "heater should supply warm air."

As somebody once said, "blessed are the consultants, for they shall inherit the earth." And maybe they will, if the tax collectors don't get it first. But sometimes, really, it just plain appears that there's a tremendous amount of physical and mental energy going into over-complicating things. Maybe there are, indeed, 64 basic tasks which an engineman performs. Maybe somewhere there's an engineman who could rattle them off on demand. Maybe. Meantime, be thankful for the years of experience and the pride that most engineers bring to their work. Be thankful for the improvements in engineman training that have been made—the locomotive simulators and such—that are helping make engine-driving a young man's job, too. Think about 64 tasks. But don't think too long.

Trust-fund diversion heads for showdown

The Congressional fight over diversion of Highway Trust Fund monies for mass transit has become increasingly heated with a Senate showdown scheduled late this month.

Rapid transit forces scored heavily when Rep. John C. Kluczynski (D.-Ill.), chairman of the House Roads Subcommittee—for years a virtual highway bailiwick—announced that he has swung over to favor proposals that would open up the Trust Fund to non-highway uses, including rapid transit.

Rep. Kluczynski's switch, said observers, was engineered by Chicago Mayor Richard J. Daley.

As predicted, however, the Senate Public Works Committee on March 1 reported out a highway aid bill (S. 502) that did not allow states and cities to use urban highway money from the Fund for mass transit uses.

That is what happened last year, followed by the Senate voting 48 to 26 to overturn the Public Works Committee and sanction transit aid.

Sen. Edmund Muskie (D.-Maine), whose pro-rail amendment lost 8 to 6 in the committee, said he expected to win handily on the Senate floor when the issue comes to a vote in late March.

Sen. Muskie's proposal would allow cities to use the $850-million annual urban highway allocation in the $3.25-billion bill for non-highway use.

But Sen. Jennings Randolph (D.-W. Va.), chairman of the Public Works Committee and leader of the pro-highway faction, said the Senate vote would be closer than last year's.

Meanwhile, DOT on Feb. 21 sent to Congress the Administration's proposed highway bill (S. 967) and a series of amendments to the 1970 UMTA Act. The highway bill would allow states and cities greater flexibility in allocating funds for mass transportation, including rapid transit, with an average of $1.2 billion annually over three years directed to cities.

The Administration-backed amendments to the UMTA Act of 1970 would increase UMTA's contract authority from $3.1 billion to $6.1 billion and increase to 70%, instead of the current 66 2/3%, the Federal government share of a rapid transit capital improvement project. Transit leaders are supporting other bills that would increase the Federal share to 90%.

Reinforcing the position of the pro-diversion forces is President Nixon. In two recent speeches he has strongly reaffirmed the Administration's commitment to diversion. The President said transit can relieve urban congestion and also cut pollution.

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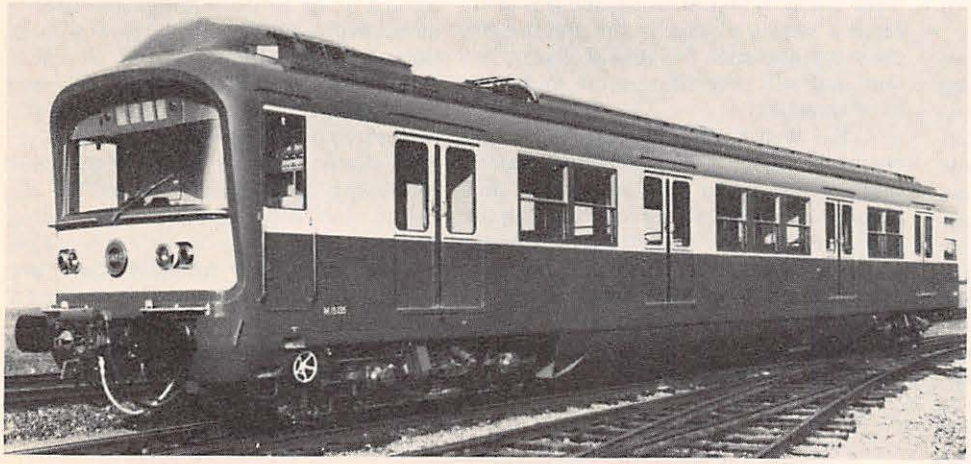
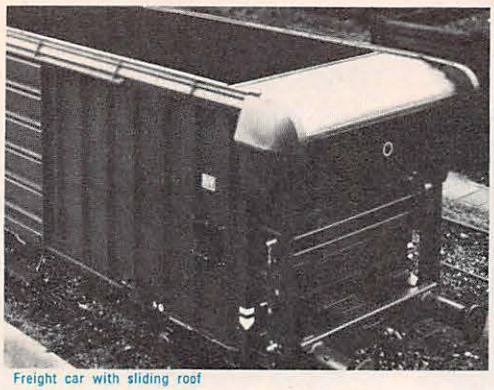
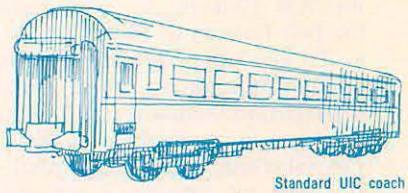


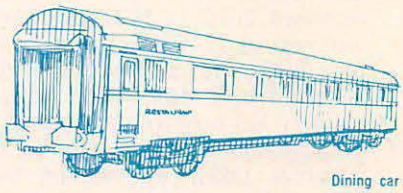


Freight car with sliding roof

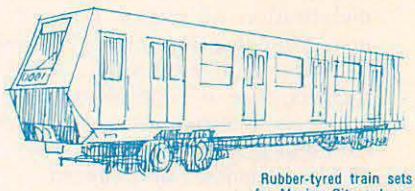
Heavy crew trolley



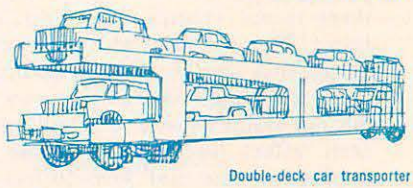
Standard UIC coach



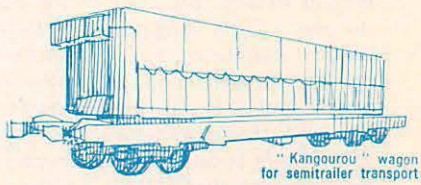
Dining car



Rubber-tyred train sets for Mexico City subway



Double-deck car transporter



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What can be done about M/W's biggest problems

What are the biggest problems in maintenance-of-way today?

Topping the list is the lack of money, which has prevailed over a period of years. Going down the list: the FRA Track Safety Standards, especially the provisions relating to defective rails and ties. . .the need for maximum utilization of work equipment. . .training and developing an adequate supervisory force, as well as competent equipment maintainers and operators.

These are the main problems as seen by a panel of top engineering officers at a recent meeting of the Maintenance of Way Club of Chicago. The officers also related what they were doing or planning to do in facing up to these problems. Moderator of the discussion was A.B. Hillman, Jr., chief engineer of the Belt Railway of Chicago.

To give first the proper perspective of the situation in which engineering officers find themselves, A.L. Sams, vice president and chief engineer, Illinois Central Gulf, pointed out that, while the cost of labor and materials had increased 267% in 1971 over the post-war year of 1947, revenue per ton-mile for the entire railroad industry had increased only 48%. That the railroad industry has survived under these conditions, Sams said, was due to several measures taken by railroad managements, "the most important being dieselization of motive power." Other managerial decisions, Sams said, resulted in longer and fewer trains, heavy cars, mergers, use of computers, improved materials, reduced services and mechanization of M/W practices.

● **Maintenance is reduced.** "When you're faced with making a budget and there is not enough money for everything," Sams continued, "you look for things that can be omitted in order to meet the budget. Of course, you can't cut out trains because this will immediately affect revenues. The same thing applies to cars and locomotives to a certain extent. But, one thing you can do over a fairly long period of time is to reduce maintenance. This means you operate slower. You may have derailments, but it is still something you can do, and that's what we have done. I think there is not a railroad represented here tonight that is in as good a condition as it was in 1947."

● **Effect of FRA Safety Standards.** One subject of uppermost interest today to every track man is the FRA Track Safety Standards. Sams has been closely involved in all discussions of this subject with the AAR as well as with the FRA. "We've done a fairly good job in arriving at reasonable track standards," he said. "None of us likes the idea of having to have the Federal government impose standards for us to maintain our tracks by, but nevertheless we have them and we're going to have to learn to live with them."

Sams said he feels that a further revision of the standards is required, particularly concerning rail and ties. He believes the requirements for replacing defective rails are too tight. The same thing applies to crossties. Although the crosstie standards will not be in effect until next October 16, Sams said the railroads must start planning now to meet them. The crosstie standards will cause a serious change in the practice of cycle maintenance for at least a year, he said, and will necessitate more spotting-in of crossties.

C.E. Weller, Rock Island's chief engineer, agreed with Sams and stated that, if he is to be limited on the number of crossties, his road is going to mark ties for renewals differently from the way it had been doing. "We are going to have to educate our tie markers to mark ties on the basis of bringing the tie condition into compliance with FRA standards," he explained.

The FRA standards are also having an effect on programs for laying rail. Weller said his road had always used the failures found by detector cars as one of the criteria for determining where rail should be laid. This practice will be continued as he believes "the detector-car failure record is the single most important factor for determining where to lay secondhand rail."

● **Utilization of work equipment.** The problem of getting better utilization of M/W machines was discussed by J.B. Miller, Santa Fe district engineer at Topeka, Kan., who said that Santa Fe was considering setting up a central control point for allocating and assigning work equipment. In view of the large fleet of work equipment possessed by his road and the extensive investment involved, he said maximum utilization must be obtained from all units. One way to obtain this, Miller believes, is by charging each user a rental fee for each piece of equipment.

A survey his road made showed that too many units were held on the divisions too long and were not being worked. Charges for these machines go on day after day whether they are worked or not. He felt that by having a control center to monitor the machines, there will be less waste, as the center will be charged with the responsibility

THE CASH CRUNCH

With not enough money to go around, you look for things that can be omitted.
—A.L. Sams, Illinois Central Gulf

TRACK STANDARDS

Tie-marking practices must be changed to bring ties up to the new standards. —C.E. Weller, Rock Island

of knowing where each machine is and what it is doing.

The control center would work on a long-range plan of about five years, Miller explained. One of the things it will study is the normal field maintenance required for the various work units. "This is an area that we need to look at real hard," Miller said, "because keeping these machines running is also one of the keys to equipment utilization. Also, the fleet of equipment we own is affected by new equipment purchased, shop maintenance and retirements."

Presently, Miller pointed out, the Santa Fe budgets for the maintenance of roadway machines. "We are not going to require this," he stated, "we're going to require that they budget the rent. We will sit down and figure what it costs for equipment ownership. At the outset, these costs may not be exact but they will become more accurate. We feel we would like to go to the package-concept method for equipment for certain gangs." This would be for the tie-renewal and surfacing gangs, he explained.

Two major factors that affect equipment utilization, Miller stated, are fluctuations in traffic densities and climatic conditions. The Santa Fe has, in several instances, changed normal work hours to meet traffic densities. It also tries to schedule rail laying so as not to interfere with the larger movements of potatoes and wheat. Weather also affects the time when equipment can be used, and Miller feels that realistic programming should be projected for mechanized equipment used by surfacing and tie gangs. He said 176 working days per year are all that should be counted on, "otherwise you're gambling."

The new roadway machine program is expected to save money by better equipment utilization. Miller said it may be learned that the road shouldn't even own some pieces of equipment that are used infrequently. It will ask whether it can afford to own such units and, if not, the road may look into the possibility of leasing them.

● **The people problem.** Although it is not part of Santa Fe's roadway equipment program, Miller pointed to another problem that is giving his road concern. That is the need to develop expertise among foremen and machine operators to obtain the desired machine performance. Terming this "one of our most difficult jobs," Miller said his road is looking into the problem with the goal of improving the quality of its machine operators.

Another aspect of the people problem was discussed by B.J. Worley, vice president and chief engineer of the Milwaukee Road. He said that training people was a major problem faced by the Milwaukee Road. The need for training exists in every area of the M/W department, he said. He went on to explain what his road has accomplished with employees in the signaling branch of the department.

During 1968, it became evident that the road's conventional method of training signalmen was not producing the competent personnel in adequate numbers to meet either current or future needs. By conventional method Worley said he meant having signal helpers work alongside experienced signalmen. He had heard that the Canadian National also had experienced the same problem and had developed a course of instruction for signalmen. Upon request, CN sent its material to him and gave permission to use it. Worley assigned a staff signal engineer to re-write the Canadian National program to fit the needs of the Milwaukee.

Meanwhile, negotiations were begun with the Brotherhood of Railroad Signalmen. After numerous meetings, an agreement was reached whereby all assistant signalmen would be required to take the training course with the understanding that the men who failed any section of it and did not obtain a

EQUIPMENT UTILIZATION

ATSF may set up a central control point for allocating and assigning machines. —J.B. Miller, Santa Fe

TRAINING

Finding that conventional methods no longer worked, Milwaukee tried something new. —B.J. Worley, Milwaukee Road

BRINGING IT ALL TOGETHER

Belt Railway of Chicago's A.B. Hillman moderated recent engineering problem-solving session.

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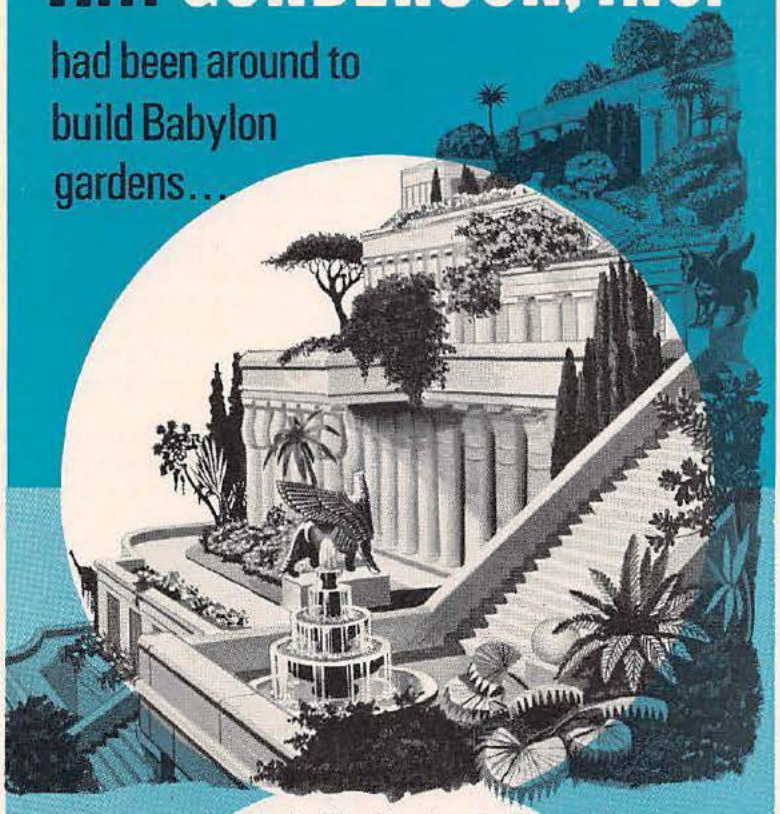

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WELDING THE WEST TO THE WORLD

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passing grade on a re-test could be dismissed.

The training course consists of six one-week sessions. The men receive full pay and expenses while attending school. Worley said that about 60 men will have completed and passed the course by May of this year. As rapidly as they finish the course, the men are placed.

Has it been worth while? Let Worley answer: "This has made a noticeable difference in our signal performance and we've noticed a big improvement in morale. Our turnover has dropped. The men are staying in signal work and are exhibiting a very healthy attitude with regard to their jobs. We are finding that these classes are an ideal proving ground for future supervisors and give us the chance early to pinpoint their potential."

● **Training equipment maintainers.** Two years ago, the Milwaukee organized a seminar for equipment maintainers. This action was prompted by the poor performance of many mechanized gangs because of machine breakdowns. The failures in many cases were due to the lack of knowledge by machine operators, misuse of the units and lack of preventive maintenance. The road held four-day seminars at various locations on the system so that some 50 men, including maintainers and some gang foremen, attended. As a result, Worley stated, down-time of machines was reduced 50%. He added, "We haven't solved all our problems but I think we are headed in the right direction. We will continue to hold these seminars and our next move will be a school for our foremen and gang foremen."

● **Hard to get foremen.** C.E. Weller referred to the difficulty in getting men to fill supervisory positions. One reason for this, he said, is that there is little differential in pay between the supervisory personnel and the union man. This necessitates going down the seniority lists to find a man willing to accept the job.

Quite often, these men are young and have only five years or less railroad experience, he stated.

About two years ago, convinced that the road needed a training program, Weller's office began to issue track-maintenance letters. The letters go to the divisions and are circulated among all roadmasters, track supervisors and track inspectors. The Rock Island asks these men to study the letters and to discuss the instructions with the men in the gangs. Without these discussions, Weller is certain the letters will not do the training job.

To date, about 24 maintenance letters have been issued. It is Weller's thought that some day the letters will be reviewed, brought up to date and used as a training manual. ■

80 new locomotives are going to shorten the road between Brazilian mines and the rest of the world.

General Electric do Brasil S.A. is now manufacturing 80 locomotives of 2,300 h.p., 180 metric tons, each - the largest diesel-electric locomotives ever built in Brazil.
The Rede Ferroviária Federal S.A. ordered these units in 1971 and delivery started on time in December 1972.
These locomotives will transport iron ore of the MBR project from rich Brazilian mines to the port of Sepetiba in the State of Rio de Janeiro as part of one of the biggest export programs in Latin America.
This new GE-Brazil manufacturing program comes right on the heels of the final delivery of an order of 80 locomotives of 1000 h.p. each to the Rede Ferroviária Federal, under the re-equipment program of the national railroads, headed by the Ministry of Transportation.

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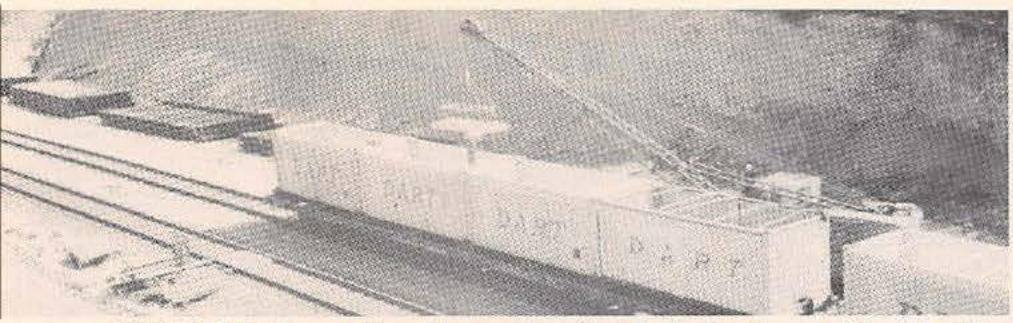


CONCRETE TIES were shipped in containers from England and were off-loaded at Fitzwilliam, Alta., where they were assembled into 39-foot track panels.

CN tests concrete ties for more durable track

Canadian National recently completed construction of a concrete-tie test track to test the over-all function of its components under heavy-train operation, rather than testing specific components. CN's goal with the test track, four miles long, is "to design and install a track structure that will have the ability to maintain its geometry and its resilience for longer periods of time under greater stress."

● **The problems.** Conventional track, CN has found, is generating problems under the steady increase in axle loads and train speeds, including six-axle diesels and unit trains. These cause greater stressing of rails, ties and substructure, resulting in accelerated and excessive wear, crushing of wood ties under the tie plates, widening of track gauge, and general misalignments of track.

Impressed by the performance of concrete ties on foreign railroads, and concerned about the increasing difficulty in obtaining wood ties in the proper quantity and quality, CN undertook as early as 1961 a project for testing various designs of concrete ties on the system to determine their behavior under existing train loads and cold-weather conditions.

It was decided to base the test track on the concept of 132-pound RE high-silicon, continuous welded rail, fastened to prestressed monolithic concrete ties restrained in longitudinal and lateral directions by well-compacted and drained crushed-rock ballast.

● **Where it is.** The question arose: Where would be a good location for the test track? Primary consideration was given to a location where six-axle diesel locomotives and unit trains were operating on heavy down-grades with curvatures up to six degrees. Other considerations included an alignment containing a series of sharp reversed curves with short connecting tangents and a traffic density of more than 20 million gross tons per year. A survey of main lines over the system narrowed the selection down to the Albreda subdivision on the Mountain Region, about 25 miles west of Jasper, Alta.

This section is relatively free of frost heaving. The sidings at both ends of the test section had stockpile areas for all track materials, as well as space for panel-track assembly. Timetable speed for passenger trains is 40 mph, express trains 35 mph, and for all other movements, 30 mph. Total tonnage moved over this section in 1971 amounted to 31 million gross tons.

The Albreda subdivision between Jasper and Redpass Junction carries an average of 40 trains per day. Under these conditions it was difficult to schedule track time. To minimize interruptions to regular train service while installing the concrete tie test section in place of the wood-tie track, it was decided to detour traffic over a two-mile-long shoofly parallel to the existing mainline. This decision permitted tests to be conducted on ballast sledding, to determine forces and cycles required for maximum ballast compaction, establish methods for handling concrete-tie panels and gather other important data before interrupting mainline traffic.

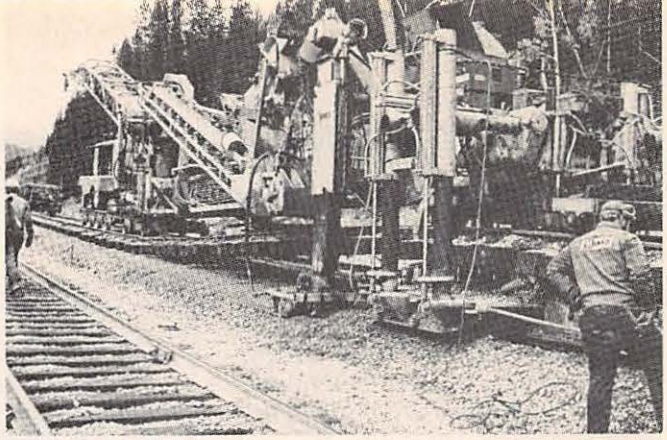
● **British tie selected.** By 1971, considerable experience had been gained on the behavior of various concrete ties and

TRACK PANELS were distributed and the Pandrol

rail fastenings under test. From their performance under a wide range of climatic and operating conditions, it became apparent that British Rail's prestressed, monolithic concrete tie F23 with the Pandrol rail fastening was the most maintenance-free track structure for CN's mainline traffic and weather conditions. The railroad felt, therefore, that it was logical to install the proven F23 tie with the Pandrol rail clip, rather than embark on a design of its own.

Due to the small quantity (10,000 ties) involved in the test, the concrete ties were manufactured by Costain Concrete Ltd. in Britain. The F23 had to be modified slightly to suit the road's six-inch rail base and to provide a larger end area to increase lateral stability. The tie was renamed CC241 for Canadian identity. The over-all length of the CC241 is 8 feet 3 inches. Its soffit width throughout its length is 10 3/8 inches. Its depth under the rail seat is 8 inches. The tie is prestressed by 26 high-tensile idented steel wires of 0.2-inch diameter which have an ultimate tensile strength of 100 to 110 tons per square inch. The

rail clips held the ties in their spaced positions without slipping on the rails.



ROCK BALLAST was spread and sledded with a Mannix Autosled specially equipped with vibrator compactors to consolidate the ballast.

WOOD-TIE TRACK was removed and concrete-tie panels were laid on the well-compacted roadbed. Joints were normally squared.

ANOTHER SPREAD of fresh ballast was made and the track raised, tamped and lined, after which continuous welded rail was laid.

weight of the tie is about 615 pounds. The cant of the rail seat is 1 in 20, compared with CN's standard cant of 1 in 40.

The Pandrol rail fastening assembly is basically made up of four malleable-iron shoulders cast directly into the concrete during manufacture of the tie. The rail is secured by driving two elastic clips into housings in the shoulders. The two clips at each rail seat are opposed. Hence, rail creep is resisted in both directions. To increase the toe load of the clip and to prolong the life of the nylon insulators, the clip was modified by flattening the toe to provide a greater bearing area at the point of contact.

The reliability of track circuiting with concrete ties is achieved by the inclusion of insulating pieces at the rail fastening. The Pandrol rail assembly has been designed to include an insulator consisting of a malleable-iron plate covered with nylon material.

In examining the rail problem on the Albreda sub-division it became apparent that, if standard carbon rail was used in curves over four degrees, the rail would have to be transposed or even removed due to corrugations or excessive flange wear in less than two years. Since such a short period would be insufficient to fully assess the merits of the strengthened track structure, it was decided to use 132-pound high-silicon rails for the entire project.

● **Work procedure adopted.** Believing that the success and economy of every track project depends essentially upon the on-track time available to track forces, the road studied various techniques for determining the most effective plan for installing the test track while maintaining train service. Using conventional and readily available equipment, the following method was adopted:

(1) Sled the existing ballast, scarify the old tie beds and compact the ballast uniformly over the entire length of the ties by means of vibrators, while maintaining the track for train operation at reduced speed.

(2) Unload crushed-rock ballast.

(3) Sled the track onto new ballast and compact again over the full length of the ties, for a four-inch lift.

(4) Dismantle the wood-tie track.

(5) Install concrete ties using the panel construction method (square joints).

(6) Unload more ballast to fill the tie cribs, line, surface, etc., and widen shoulders.

(7) Relay CWR and connect the strings with thermite welds.

The panel method was selected to get the ties installed accurately but still fast and economically. A complete concrete-tie panel weighs about 8½ tons. This posed the problem of getting a crane with sufficient capacity to lift the panel and turn 180 degrees. This was solved by using a recently acquired 40-ton American diesel-electric crane with a 60-foot boom. A Burro 10-ton panel lifter speeded the handling of the panels.

The concrete-tie panels were assembled at Fitzwilliam, the western terminal of the test section. A fork-lift truck picked four ties at a time from the stockpiles and placed them on the skid

CN test installation is expected to determine the future of the concrete tie in Canada

rails of the panel template, where they were spaced at 24½-inch centers to marks on the skid rails. The rail seats were swept before a crane set 132-pound 39-foot rails between the cast-in shoulders of the ties. The rail clips were applied without insulators. The clips exerted sufficient clamping force to hold the ties in position while the panels were being loaded onto flat cars by the 40-ton crane. Six panels were loaded on a car and were later distributed along the track shoulder by the same crane.

● **Ballast depth increased.** The depth of ballast along the test track section was about 14 to 15 inches. It consisted of clean, crushed and screened gravel with maximum stone size of 1½ inches. Although somewhat on the smooth side, it was decided to use this material as sub-ballast and add another 10 inches of clean crushed rock to make the ballast depth at least equal to the tie spacing.

One important condition of the track structure was that the concrete ties were to be laid on a perfectly profiled and well-compacted bed, and to avoid center-bound track. Mannix International had already done considerable study and research on the subject and recommended the use of 12 air-operated, vibrating, ballast compactors with plates 12 inches by 18 inches in size, covering a width of 12 feet, to be added to its Autosled.

The compacting unit was built in two halves, one carried on each side of the sledding machine and mounted on hydraulic rams. When operating, the halves were swung into position under the track and locked together in the middle.

To loosen the old tie beds before placing the new ties, eight steel teeth were attached to the sled to scarify the ballast at least three inches below the original base of tie for the full length of the tie.

On September 9, the main line at Mile 24.8 was lined over and connected to the shoofly. With train traffic detoured over the shoofly at 20 mph, the installation was ready to start on the old main track.

● **Ballast sledding.** The Mannix Autosled is comprised of two units: The Autosled provides the power to operate all of its equipment; and the Winch Cart pulls the sled. The Winch Cart is connected to the sled by cables and a spreader bar. After the Cart anchors itself about three rail lengths from the sled, it pulls the sled slowly and smoothly along under the ties. While the track is in a raised position, the ballast is first scarified, then leveled and finally compacted. The track settles back to a smooth and compacted ballast bed about 12 feet wide. It was reported that best compacting results were obtained at a working speed of 1,200 feet per hour. Greater efficiency and more uniform compaction was obtained by using a 5000-class diesel unit equipped with a pace-setter, operating at a steady speed of 1,100 to 1,400 feet per hour. Because the existing track was well ballasted, the skeletonized track was raised by an average of 3½ inches.

After sledding the track settled down on a level and compacted ballast bed and only the ends had to be surfaced for making suitable run-offs. The Autosled realigned the track closely to the original line and no other track lining was required at this time. After new rock ballast had been unloaded over the entire sledded track, traffic was resumed at reduced speed.

The second sledding of the ballast was similar to the primary operation except that: (1) No scarifying was necessary as the tie beds had not consolidated enough since the first sledding; (2) the ballast to be sledded was about one inch above the ties which raised the track an over-all of four inches; and (3) no attempt was made to correct the misalignment.

For comparison purposes, CN used its own ballast sled for about two miles and pulled it with an engine from a work train. To compact the ballast, a hand-guided roller-vibrator, as often used by roadbuilders, was substituted. This vibrator followed the track-dismantling force.

● **Installation of track panels.** After existing track had been removed, the crane lifted the concrete-tie panels from the shoulders and placed them on the prepared roadbed. On tangent track, the panels were laid with the joints squared. On curves, and where joints in the outer rail fell behind those on the inner rail, the low rails were laid tight and the joint bars applied before the front end of the panel was lined over to the exact position. The crane then moved forward over the rail gap on the high side to install the next panel. When all panels for the work period were in place, the crane returned to the first rail to be adjusted. All clips were knocked off and the crane lifted the rail about six inches and closed the gap.

A few clips were driven into the tie shoulders to secure the rail for the crane to advance for adjusting the next rail gap. The joint bars were then applied to the high rail and the clips refastened behind the crane. Under normal conditions, the crane installed an average of eight track panels per hour.

Meanwhile, the 36 strings of welded 132-pound rails were being unloaded on the track shoulders. Preparatory to installation these were threaded onto the track between the running rails. The 39-foot rails were then barred out of the track and the welded rails placed in position on the ties. Since the rail and ambient temperatures were well below the preferred rail-laying temperature of 65 degrees a rail heater was used to bring all rails to an adjusted temperature of 55 to 75 degrees F. The Pandrol clips and nylon insulators were then applied.

● **Thermite welds used.** For the thermite welds that were made to join the long strings, a special thermite charge was developed with a Brinnell hardness of about 300 for use with the high-silicon rail. Care was taken in making welds to assure that each fell at about the center of a crib to avoid having the welds impinge on the rail seats. A Simplex rail puller and expander was used to hold rail ends in position while welds were being made, and to maintain the required gap between the rail ends.

For the insulated joints the Portec bonded insulated joint was used.

Immediately following installation of the continuous welded rail, sufficient ballast was unloaded to surface the concrete-tie track, to fill the cribs to the top of the ties and to widen the shoulders as desired. The final operation consisted of leveling the ballast in the crib centers and adjusting the ballast on the shoulders.

● **Measuring the performance.** Performance of the test track will be evaluated by operation over the track of the road's track recorder car. During summer 1973 it is expected that CN's Research & Development department will conduct tests to determine what instruments should be installed on the test track to obtain the data needed to assess the behavior of the track structure under actual traffic conditions.

The design of the test track on the Albreda subdivision was based on the premise that the technical merits of the individual components (continuous welded silicon rail, the prestressed concrete tie and its rail-fastening assembly and the ballast) have been established.

However, no attempt was made to compare the economics of the concrete tie with the wood tie. The cost of the concrete tie, even if manufactured in Canada near the point of installation, is recognized as being very much higher than the standard treated wood tie. Careful observation of the test installation over the next few years is expected to determine the future of the concrete tie in Canada. ■

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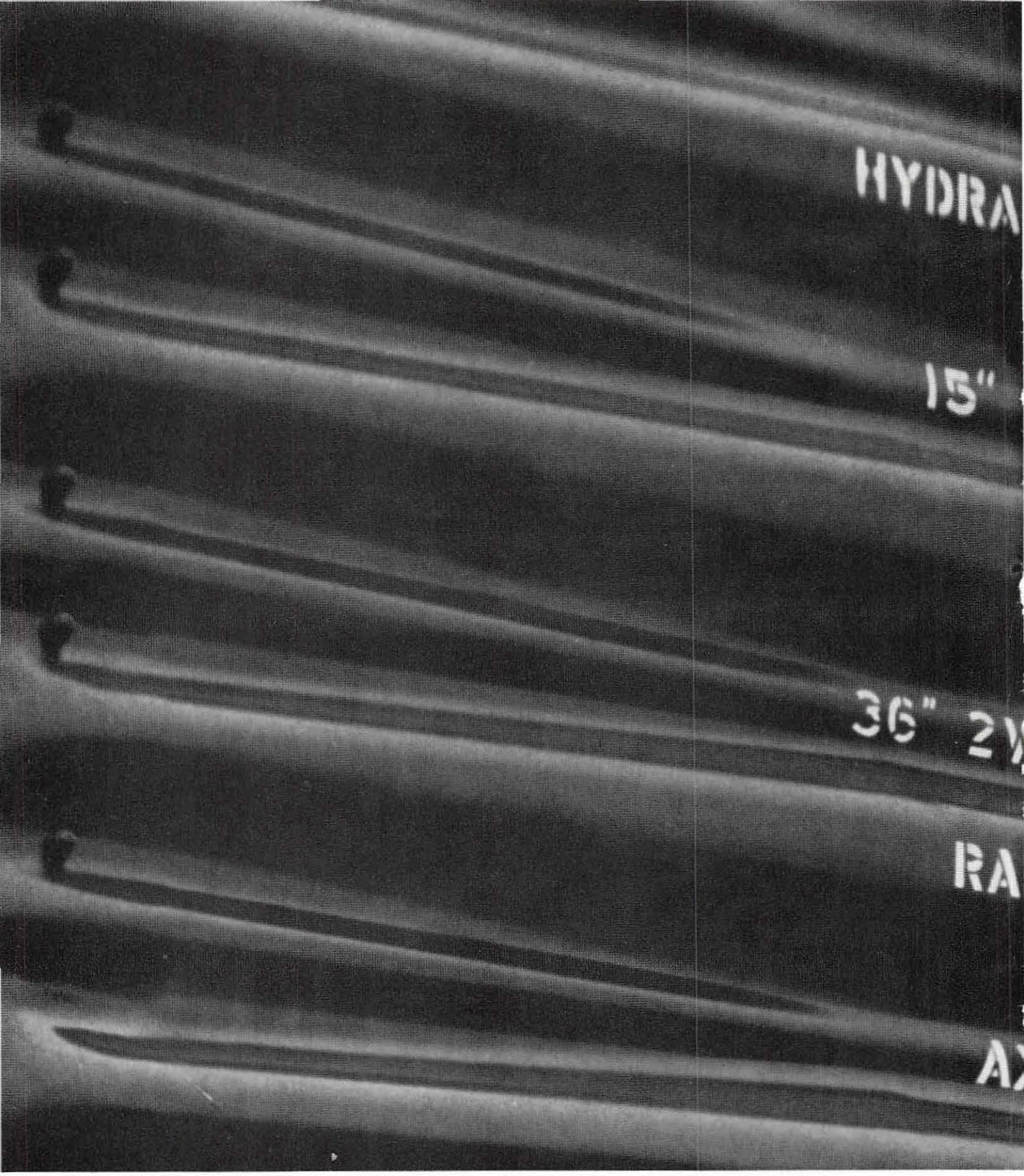

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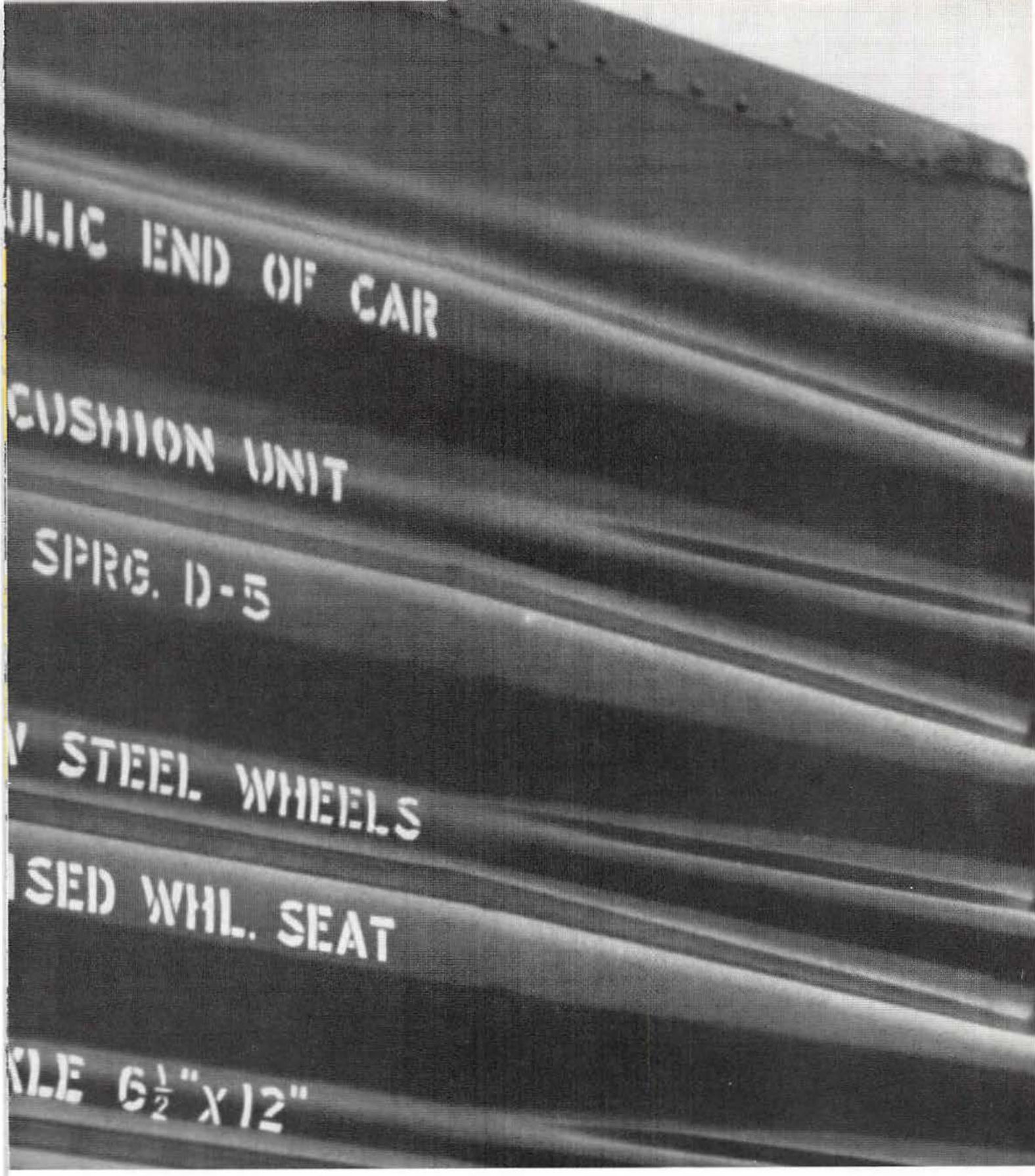

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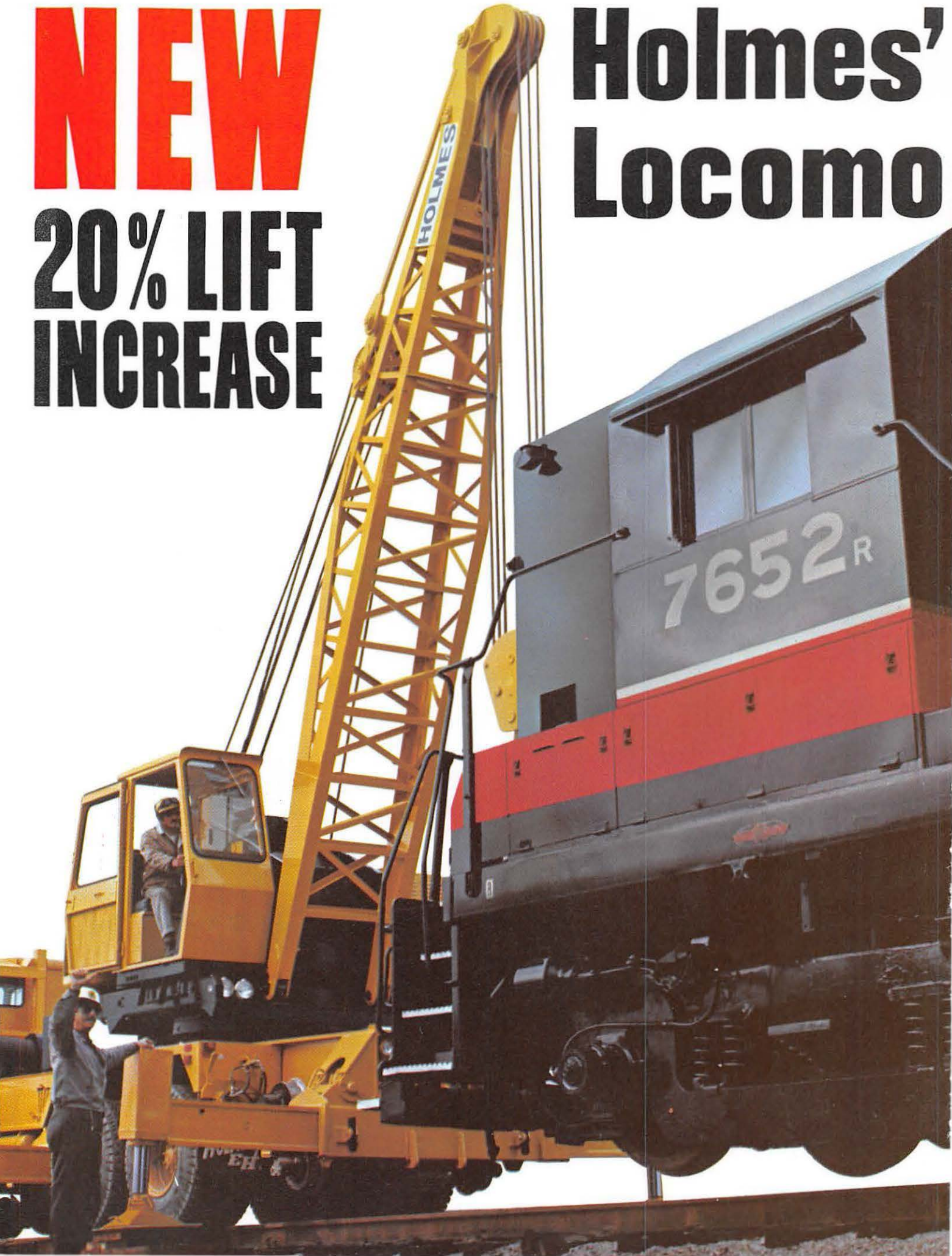

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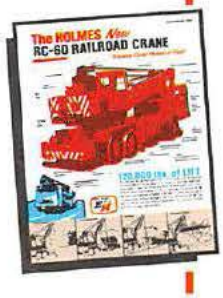

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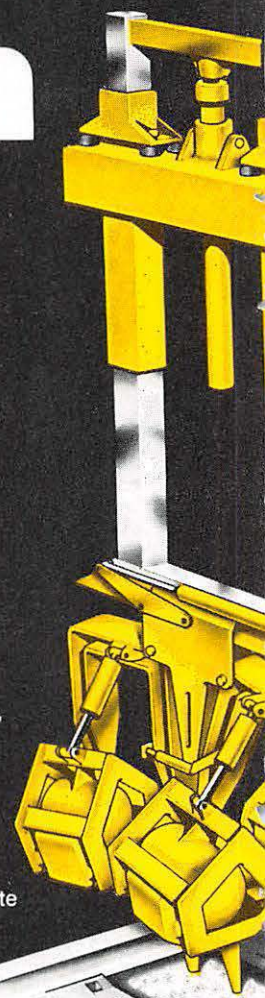


It's true! The Jackson TampTrak is a complete track maintenance unit—it raises, crosslevels, lines and tamps—all in one operation. TampTrak does the **complete** job—handles switches, insulated joints, crossovers, and close-clearance and guard-railed sections. TampTrak puts up track that is unexcelled in quality, track that retains its quality far longer.

Look at all the advantages Jackson TampTrak offers, advantages previously available only in machines costing much more!

Jackson Patented Tilt-Squeeze-Vibratory Tamping compacts ballast firmly at the greatest load-bearing area—the intersection of the rail and tie. Unlike other tampers, where the tools enter the ballast vertically and then squeeze, the patented Jackson tamper tools enter the ballast, "tilt" under the base of the rail, and then the ballast is powerfully squeezed and vibrated at high frequency. The result? A completely homogeneous and consolidated roadbed all the way to the subgrade—roadbed that stands up to both high-speed traffic and increased wheel loadings.

Tamps Switches—the Jackson TampTrak is the only unit anywhere near its low price that will tamp switches . . . 100% of a switch . . . and crossovers, insulated joints, and all close tolerance areas.

New Liner—the time-proved Jackson lining system is used to provide an accuracy capability that is unsurpassed for lining tangent and curves. Liner attachment can also be used on Jackson's Model 2300 Tamper.

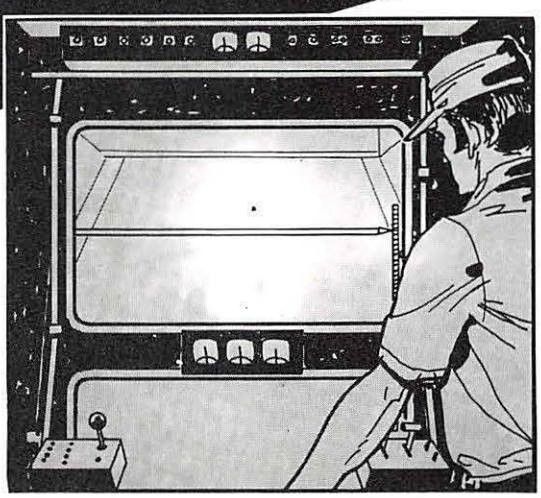
Compatible with Jackson Light-Sensing Units, either attached or independently radio-controlled, for precision surfacing, crossleveling, and lining within 1/32" tolerances. With Jackson solid-state modular constructed electro-optical systems, the operation can be entirely automatic.

Ruggedly Constructed of all-welded steel for long-life and dependability. New low-profile design is clean, attractive, simple-looking . . . with all components easily accessible for maximum ease of maintenance.

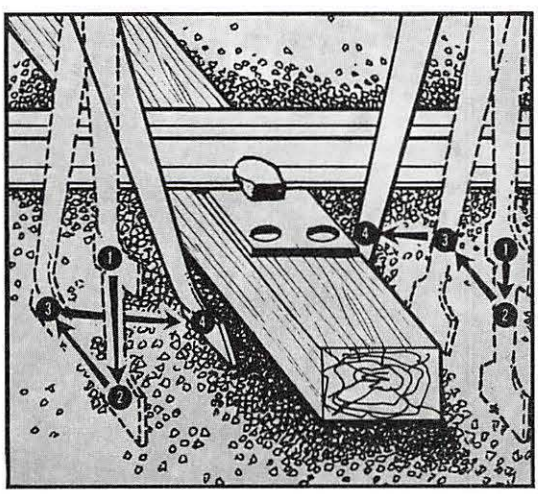
Simplified Hydraulics for reduced maintenance and downtime. Entire system is contained in workbench height, hinged cupola atop cab for ease of inspection and servicing.

Fully Enclosed Cab is spacious and comfortable, and includes every convenience feature to keep the operator at peak efficiency for maximum work accuracy. All controls are within easy reach. Low-profile design provides excellent view of track under all conditions.

The Jackson TampTrak is everything you need for complete track maintenance. Write for full information, and ask to see a demonstration of the versatile low-priced Jackson TampTrak.

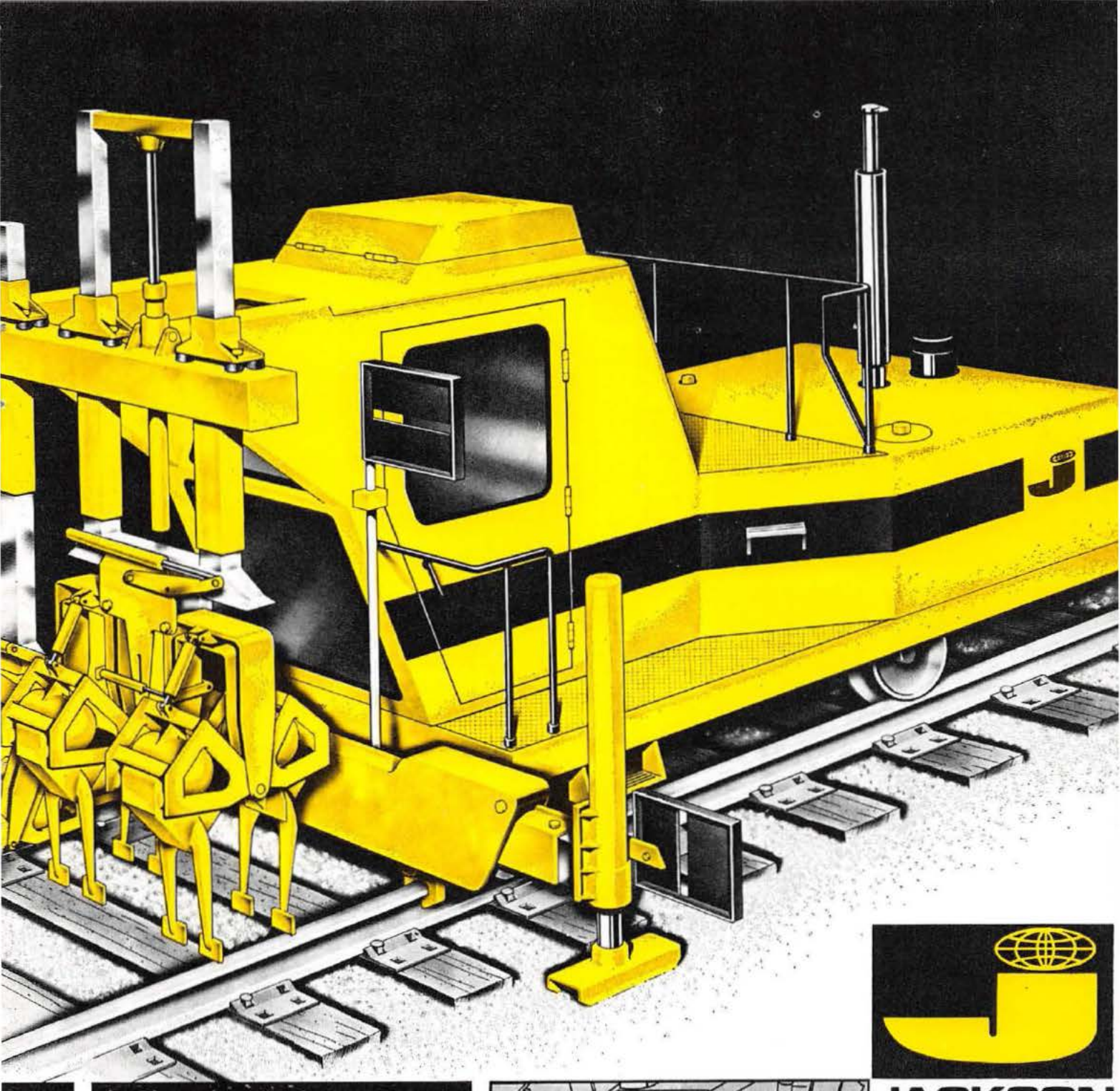


Cab is fully enclosed for safety and to comply with Federal Noise Standards. Vibration is completely isolated from cab. Modular actuated controls for jacking, crossleveling, lining and tamping are directly in front of operator.



Picture shows 2 of 16 tamping tools and illustrates Jackson's patented "Tilt-Squeeze" operation. Each of the 16 tools exerts a 4-ton blow, 4,500 times per minute, to produce a completely homogeneous, rigid sub-structure under the greatest load-bearing area—the intersection of the rail and tie.

Hydraulics are all located within the wo height cupola atop the cab. By simply the hinged cupola top, inspection or ser fast and easy.



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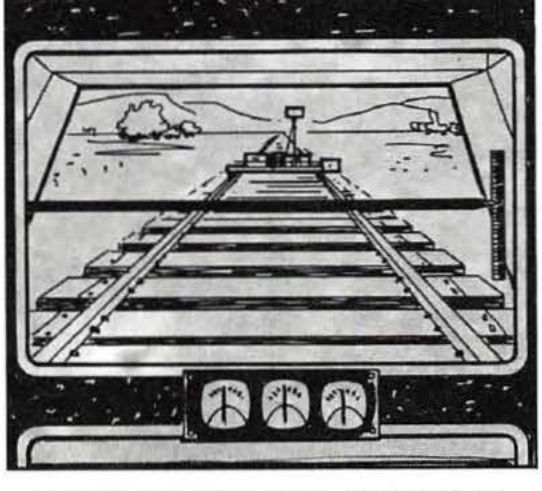
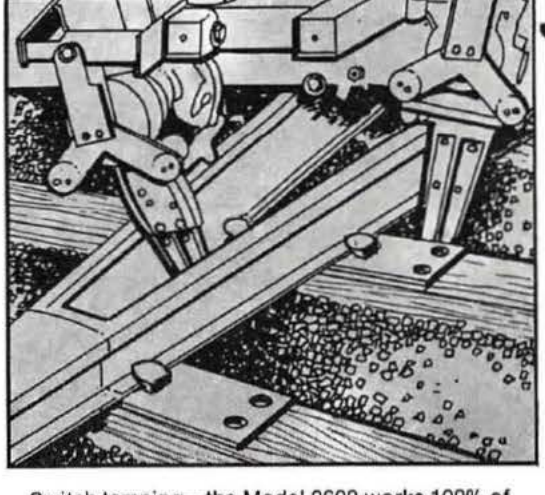


Jackson's new lining system attachment provides unexcelled accuracy in lining both tangent and curved track. Note: lining attachment can also be used with Jackson's Model 2300 Tamper. Jackson light-sensing units are accurate to 1/32" surfacing and crossleveling.



Switch tamping—the Model 2600 works 100% of a switch, plus crossovers, insulated joints and close-tolerance and guard-railed sections.

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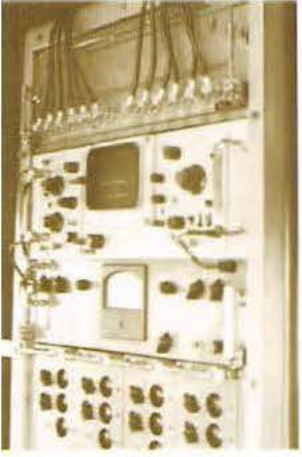

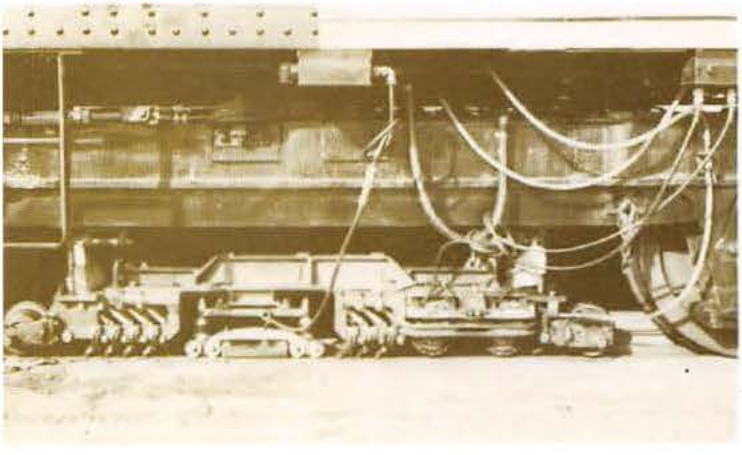

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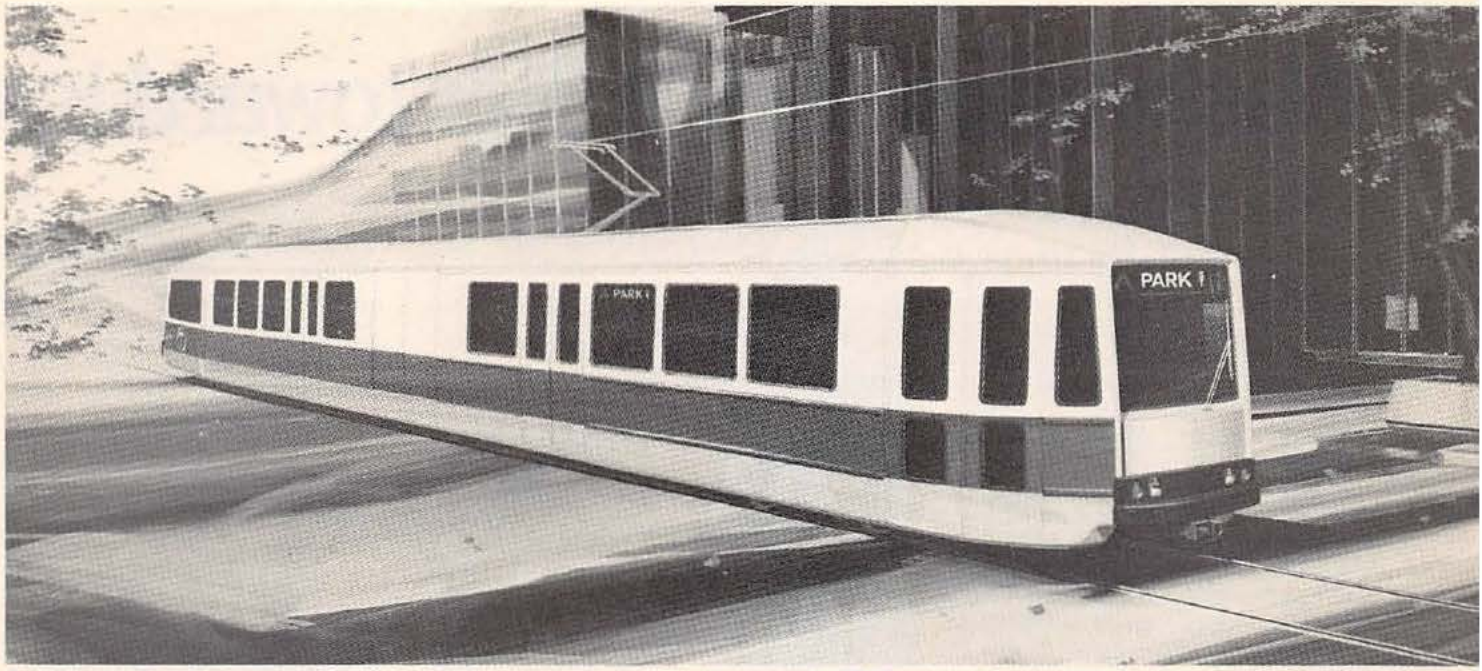


SUBWAY/SURFACE lines of MBTA will have 150 of these articulated cars in service by 1975 to replace existing PCC fleet.

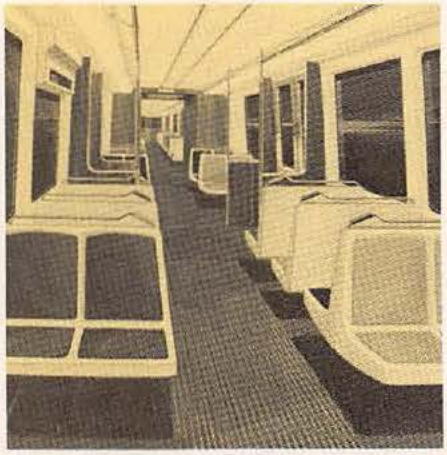
Boeing bids low on light rail cars

Boeing Vertol has been the apparent low bidder on 230 light rail vehicles for the Massachusetts Bay Transportation Authority and for San Francisco's Municipal Railway Improvement Corp. The 71-foot articulated trolleys will be the first street cars built in the U.S. since 1952. Boston will get 150; Muni 80.

"We are naturally pleased to have been selected the apparent low bidder," says Howard N. Stuverude, BV president. "Upon completion of the necessary negotiations, our plans would call for the production of one light rail vehicle per working day." He added that the first cars would be delivered about 18 months after the contract signing. They are to be constructed at Vertol's Philadelphia helicopter plant.

● **Second go-around.** Actually the current bidding is the second solicitation on the part of Muni. In the late Sixties, San Francisco began to look for replacements for its aging PCC trolley fleet. The result was a set of engineering and design specifications prepared by Louis T. Klauder & Associates, Philadelphia consultants. The cars were so sophisticated and the resulting bids came in so high that Muni hastily backed off.

This led to development of a national standard for light rail vehicles by all U.S. transit properties operating street cars. The project this time was spearheaded by MBTA. It retained the configuration of the proposed Muni vehicles. While articulation is often used in Europe, it had been infrequently utilized in U.S. street cars. It permits longer units which can operate around sharp street railway curves and provides for uninterrrupted passage through the vehicle.



CANTILEVERED SEATS, bright interiors and air conditioning are featured. UMTA funding is involved in the acquisition.

● **Air conditioned.** The final specification, put out for bid in October 1972, called for air conditioning, contoured seating and other features to maximize passenger comfort. Performance requirements were substantially reduced. Among the options were cam controls and chopper controls.

The interior arrangements of the cars will differ for Boston and San Francisco. Boston cars will have seats for 52 riders and are to accommodate 210 under peak conditions. The Muni vehicles will have seats for 68 and accommodate 190 at peak. The interiors, designed by Sundberg-Ferar, will feature molded fiberglass seats with cushioned inserts. Special emphasis has been given to colors, lighting, air distribution and air conditioning.

UMTA funding will be involved in acquisition of both groups of cars. In the case of MBTA's subway/surface trolley routes, a total of $88 million in local and Federal funds is involved. This includes the cost of upgrading track, roadbed, structures, power distribution, signals, communications and maintenance facilities. MBTA General Manager Joseph C. Kelly recently noted that UMTA funding "will permit MBTA to go forward with obtaining new vehicles to utilize these other improvements."

● **Wide spread.** The bids for the MBTA/Muni cars varied from Boeing's $267,800 for either cam or chopper control to General Electric's bid of $418,700 for cam control (GE did not bid the chopper). Other bidders included LTV at $279,700 and $298,200 for cam and chopper; Rohr at $345,900 and $393,800; Garret at $398,995 for chopper control only. Boeing's total bid was approximately $69 million for the basic cars and certain program additions. The Boston-San Francisco Committee had also asked for options on up to 25 additional cars for MBTA and 12 for SFMRIC.

While Boeing has acted as program manager for the state-of-the-art transit cars which were built by St. Louis Car as part of an UMTA program, the trolleys will be the first rail vehicles to be assembled in the Vertol plant. ■

Washington Metro digs toward late

By REID BEDDOW, Washington Editor

It is often said that residents of Washington talk only about two things: politics and real estate. This is untrue. Among themselves, Washingtonians discuss politics, real estate, the Redskins, and Metro. The last-named is the newest.

Until recently, Washington's new rapid transit was only vaguely etched on the public consciousness, despite a ubiquity of hard hats, planked-over streets, and plenty of public debates in the hearing room of the Washington Metropolitan Area Transit Authority (WMATA). In truth, the completion of the first section of line seemed securely in the far future.

● **Excitement begins.** But Metro is now 21 months away from an official opening, and tremors of excitement are beginning to ripple through a citizenry long inured to unsatisfactory buses, car pools, and slow commuting times through bridge bottlenecks, "mixing bowl" interchanges, and clogged suburban arteries which ever-wider expressways only seemed to exacerbate.

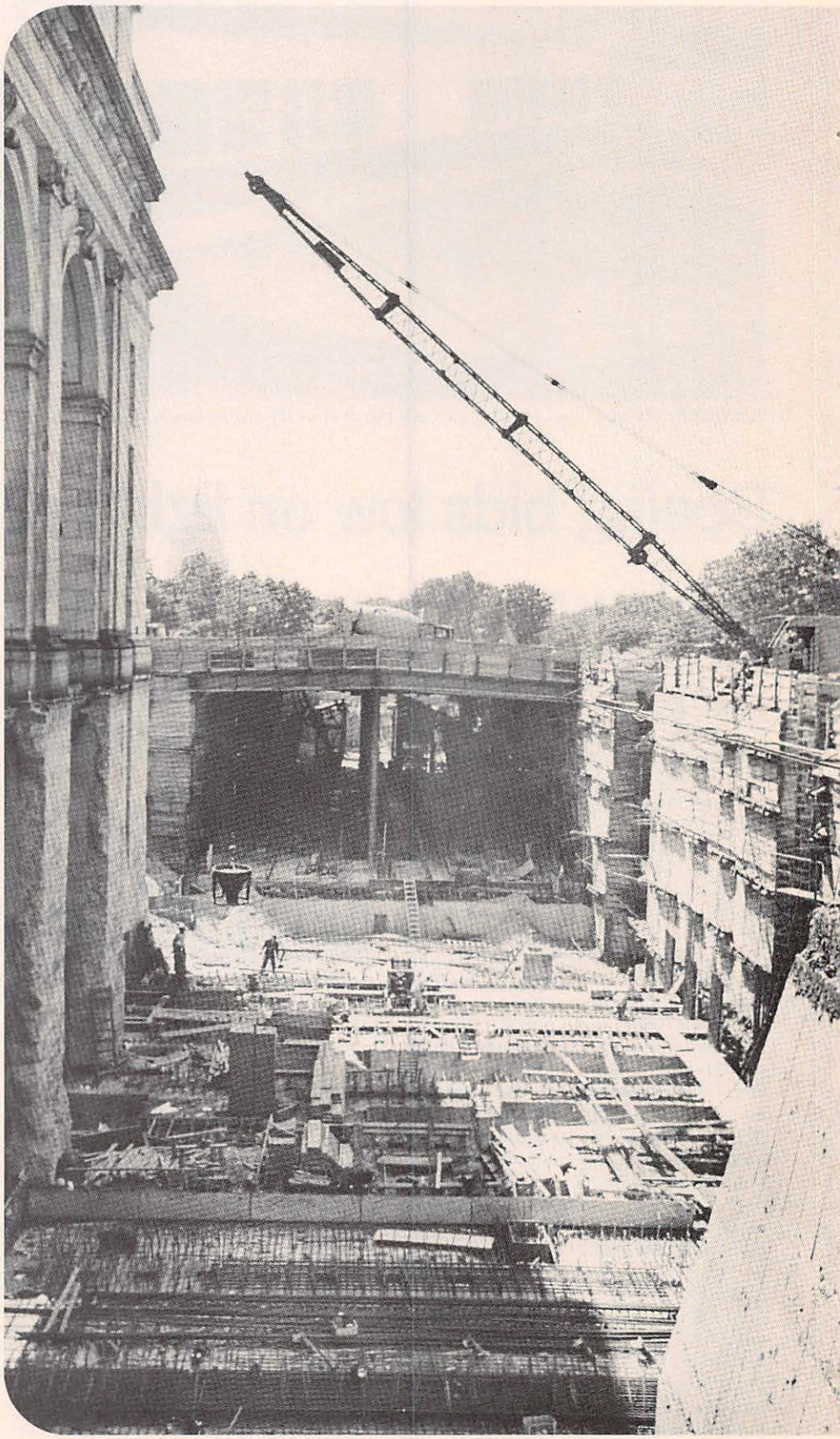
Right now, an army of hard hats (4,000 strong) swarms over the 24 Metro stations and nearly 18.4 miles of line under construction. Another 24 stations and 29.2 miles of line are under final design.

Current construction includes the 4.6-mile segment, extending from Rhode Island Ave. south to Union Station, and across the city under G St. to Farragut Place, scheduled to open in December 1974. Most of this is underground, and the men working on this segment describe it as The Hole.

It is quite a hole. Sludging through this tunnel on foot, a favorite pastime of WMATA General Manager Jackson Graham, takes four hours, a trip Metro's cars, now on order from Rohr Industries, will make in eight minutes.

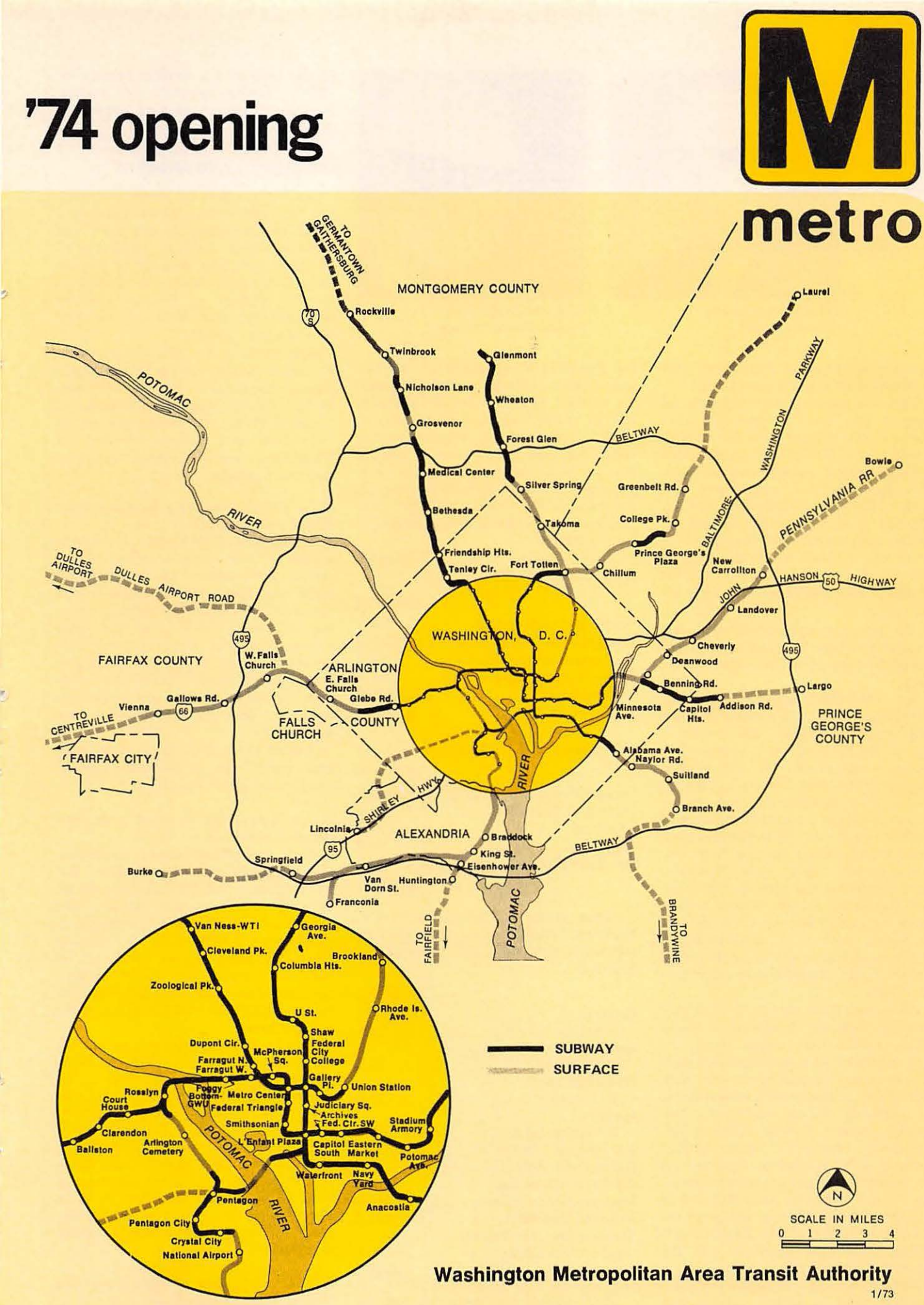
Metro won't actually be the first subway in Washington. There is a celebrated mini-line zipping the peoples' representatives between Congressional office buildings and the Capitol.

● **That showcase role.** When open, Metro is bound to be a most powerful argument for rapid transit, under the noses, as it were, of White House, Congress, and DOT/UMTA. It will be in particular a showcase for balanced, regional transportation, encompassing the District of Columbia and parts of Virginia and Maryland involving numerous county jurisdictions—an area where the largest employer is Uncle Sam, whose local payroll totals 370,000



"THE HOLE" STARTS HERE: First-phase segment, which begins at Rhode Island Ave., goes underground at Union Station. This 4.6-mile section is to open in 1974.

'74 opening


metro
TO GERMANTOWN GAITHERSBURG
MONTGOMERY COUNTY
Rockville
Twinbrook
Glenmont
Nicholson Lane
Wheaton
Grosvenor
Forest Glen
Medical Center
Silver Spring
Bethesda
Takoma
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Benning Rd.
Capitol Hts.
Addison Rd.
Largo
Minnesota Ave.
PRINCE GEORGE'S COUNTY
Alabama Ave.
Naylor Rd.
Suitland
Branch Ave.
POTOMAC RIVER
TO BRANDYWINE
TO FAIRFIELD
TO DULLES AIRPORT
DULLES AIRPORT ROAD
495
FAIRFAX COUNTY
W. Falls Church
ARLINGTON
E. Falls Church
Glebe Rd.
Gallows Rd.
Vienna
66
TO CENTREVILLE
FAIRFAX CITY
FALLS CHURCH
COUNTY
WASHINGTON, D. C.
SHIRLEY HWY.
Lincolnia
ALEXANDRIA
Braddock
King St.
Eisenhower Ave.
95
Springfield
Burke
Van Dorn St.
Huntington
Franconia
BELTWAY
Van Ness-WTI
Georgia Ave.
Cleveland Pk.
Brookland
Columbia Hts.
Zoological Pk.
U St.
Rhode Is. Ave.
Shaw
Dupont Cir.
McPherson Sq.
Federal City College
Farragut N.
Farragut W.
Gallery Pl.
Union Station
Rosslyn
Foggy Bottom-GWU
Metro Center
Federal Triangle
Judiciary Sq.
Archives
Fed. Cir. SW
Court House
Smithsonian
Stadium Armory
Clarendon
Arlington Cemetery
L'Enfant Plaza
Capitol South
Eastern Market
Ballston
Potomac Ave.
Waterfront
Navy Yard
Pentagon
Anacostia
Pentagon City
Crystal City
National Airport
SUBWAY
SURFACE
N
SCALE IN MILES
0 1 2 3 4
Washington Metropolitan Area Transit Authority
1/73

JACKSON GRAHAM,
General Manager

WARREN QUENSTEDT,
Deputy General Manager

(which is what people mean when they say Washington is a company town).

That this regional, intergovernmental compact has run so smoothly is a tribute to the dedication of the rotating members of WMATA's board, to which each jurisdiction appoints two directors. They have been creative men, like former Maryland Congressman and ex-WMATA board chairman Carlton R. Sickles, who have mobilized support for Metro since 1966, when the regional agency was created by Act of Congress (though actual planning began long before that).

The planning and construction will all start to come to fruition with the first-phase opening in December of next year.

● **For the U.S. bicentennial?** More nervousness is felt about the second-phase deadline of July 1976, when a total of 24 miles of line is supposed to become operational (at the express request of President Nixon), in time for the nation's bicentennial and an expected onslaught of untold millions of tourists. A series of labor disputes postponed the phase-one opening from July to December 1974. Any repetition could jeopardize the bicentennial deadline. The entire 98-mile system is scheduled for completion by 1979. System extensions, such as an often-proposed rapid transit line to Dulles International Airport, could extend construction into the 1980's.

All of this costs money, and Metro's costs are currently budgeted at $2.98 billion. Critics have called Metro the most expensive civil works project since the pyramids, surpassing in cost such other great public works endeavors as the Tennessee Valley Authority. Only recently, former Federal Highway Administrator Francis C. Turner blasted Metro as a "millstone to hang around our necks," meaning taxpayers' necks. That Turner's remarks were delivered to a highway and trucking group whose name, in actuality, is The Road Gang is perhaps the best comment on the cogency of his argument.

● **Money is no problem.** Metro's finances, after a choppy history, are now securely based. Congress passed and President Nixon signed into law last year a bill providing for Federal guarantee of $1.2 billion in bonds to finance 40% of the $2.98-billion estimated cost. A first installment of 40-year, taxable bonds was sold last October. A second, also for $225 million, was sold on Jan. 24 at a 7.35% rate. Remaining financial problems now involve only the comparatively minor costs of acquisition of local bus lines.

Metro's budget from 1967 through fiscal 1973 looks like this:

	(millions)
Design and engineering	$91.7
Construction	1,049.3
Real estate and rights of way	96.1
Project management	17.4
Uncommitted	210.0
Total	**$1,464.5**

The sources of these funds are:

	(millions)
Federal Funds	$ 725.1
District of Columbia	157.3
Maryland	118.9
Virginia	90.4
Net bond proceeds and interest	372.8
Total	**$1,464.5**

Metro estimates that its mechanical, electrical, construction, and physical purchases ultimately will total $734.1 million:

	(millions)
Cement	
1.5 million cu yds	$ 25.5
Reinforcing steel	
175,000 tons	50.3
Structural steel	
120,000 tons	59.6
Lumber	
150 million bd ft	36.4
Running rail (480 mi)	5.3
Contact rail (240 mi)	2.8
Electrical equipment	115.2
Mechanical equipment	140.0
Vehicles (556 cars)	199.0
Train control, electronics and communications	100.0
Total	**$734.1**

With population estimates for the Washington area predicting a doubling of the present 2.1 million persons by 1990, Metro experts see average weekday patronage reaching 959,000 at that time.

QUESTIONS—AND ANSWERS

As Metro's digs get deeper, as opening day approaches, District-area residents are beginning to ask more and more questions. Railway Age put some of these questions recently to Deputy General Manager Warren D. Quenstedt (in the absence of General Manager Graham who was away on his first vacation since 1970).

Quenstedt is the tall, eloquent Virginia-born lawyer who has piloted Metro through the political shallows for years. In his office at Metro's headquarters in L'Enfant Plaza, just around the corner from DOT and halfway between the White House and the Capitol, Quenstedt gave these answers.

Q. Is WMATA learning anything from BART's experience?

A. If you mean BART's misfortune with regard to train control, we have had a certain confirmation of our desire to make sure that our own train control system is as nearly bugproof as possible; but of course BART had the same sincere intention when it went into operation. It just found that there were some things around there that they hadn't anticipated. So I can speak from hope and they have to explain from experience.

I don't think BART's problems with train control are an incurable disease. They've just got the measles.

Q. Are you going to meet your construction schedules?

A. Yes. I shouldn't answer otherwise, else I should change the schedules. But I'm confident that the schedules we are working under now are realistic; and unless some unforeseen circumstances should arise, I feel certain we will make them. Hurricane Agnes didn't set us back very much, but the strike that occurred about that time did. The concrete couldn't be poured so the holes just sat there.

Our greatest potential course of difficulty lies in the fact that the composition of the political bodies in the region changes from time to time; you have new officials elected and new points of view. If sufficient of those come along to require reexamination of decisions that have already been made, you conceivably could go all the way back to first base and start all over. Fortunately, that cannot happen because we have over a billion dollars worth of work in progress.

Q. Can you foresee WMATA expanding into intermodal operations?

A. From time to time, people have

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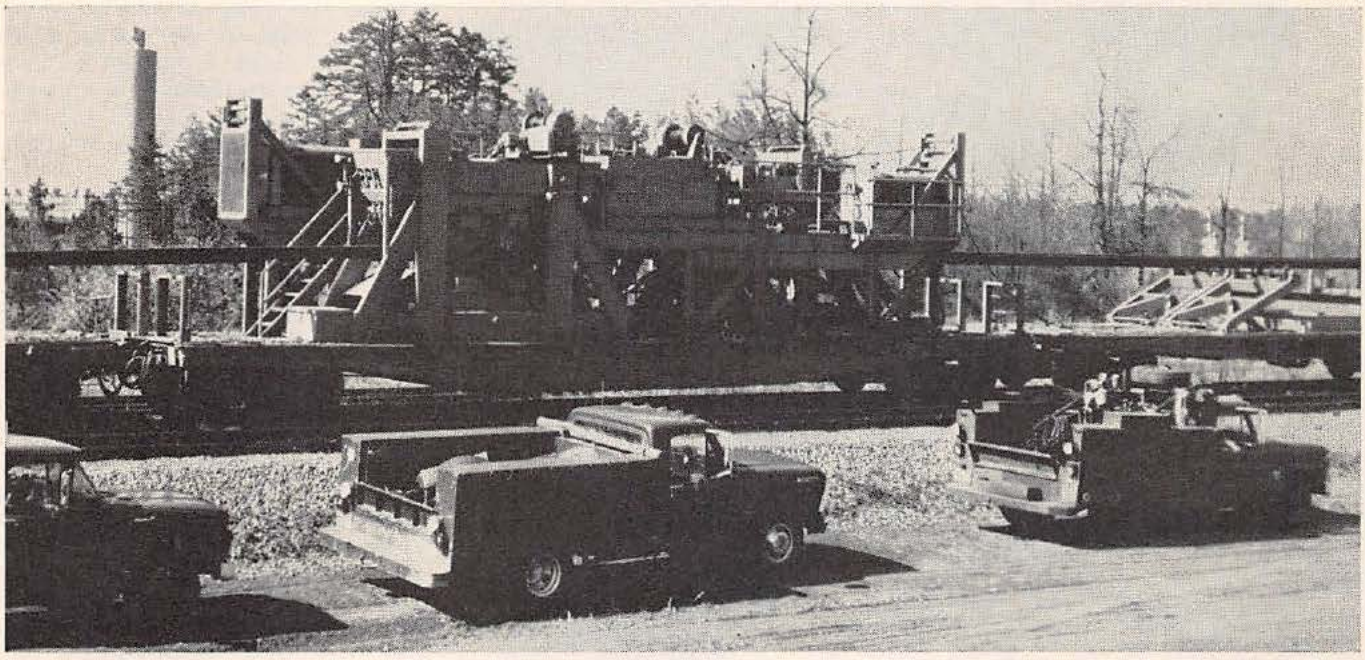

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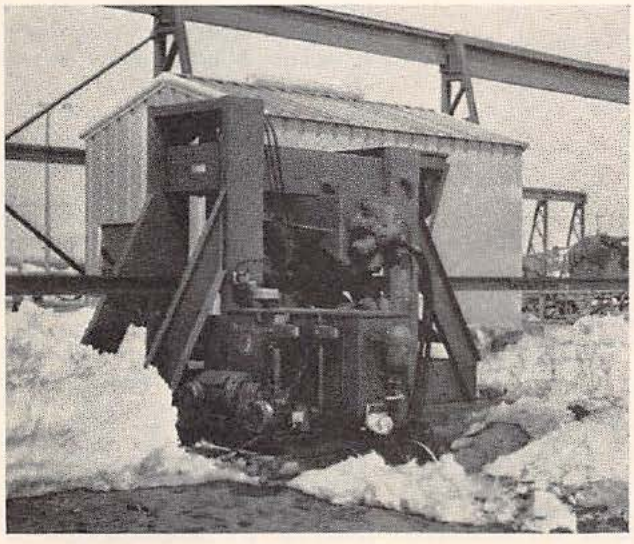

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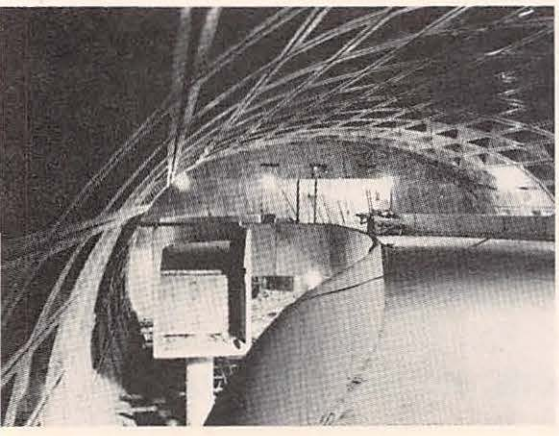
AERIAL STRUCTURE, single track, northbound, Union Station to Rhode Island Ave.



JUDICIARY SQUARE STATION shell as it passed the two-thirds mark at 400 feet.

spoken up about our possibly taking over the air operations. I would respond by saying that if WMATA represents the appropriate operational device, we would be able to do it. I think it's a political decision that has to be made. But speaking with regard to the organizational approach, or management approach, we could accept the burden, we could organize to carry out the task, and a pretty strong case could be made for it. I believe that transportation, whatever the mode, is so much a part of the life of any community that the more highly integrated you can make it the more efficient it will become, and the more serviceable it will be to the community. I really do believe in a "department of transportation."

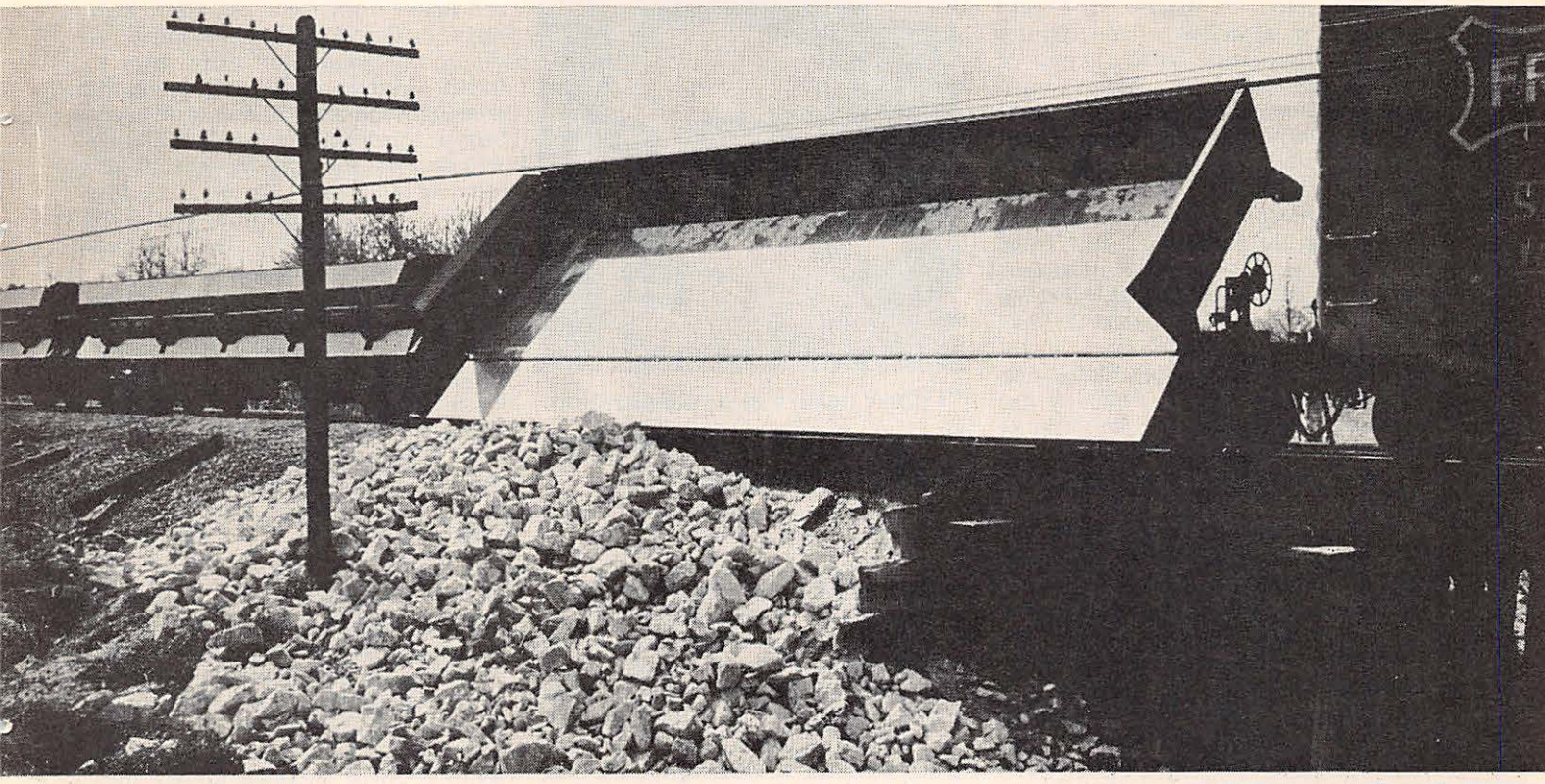
Q. Here in Washington, you've got the White House, DOT, Congress, the District, and two state governments, not to mention county jurisdictions, looking over your shoulder. Are you satisfied with your governmental relations at the various levels?

A. You described it well. I think we have more powerful governmental supervision than some others may have. We also have numerous volunteer groups watching what we do. So far as our political structure is concerned, I think it is working beautifully. The men who have been on our Board of Directors, which changes from time to time, have been very serious, they have worked hard, they have shown a high level of competence, and when the chips are down they have made the right decisions. It was something of an experiment, you know, to bring together a board of directors directly from the precincts, so to speak. In the ordinary type of authority, the governments appoint and the board and the directors are insulated from the voters. But here, each of our directors, when he votes, does so with the knowledge that it will be in the evening paper; that the people in his own electoral district will call him on the telephone if they do not approve, and that they will be capable of remembering it until election. But these men face their responsibilities, they make their political compromises, and I say they do a very, very fine job.

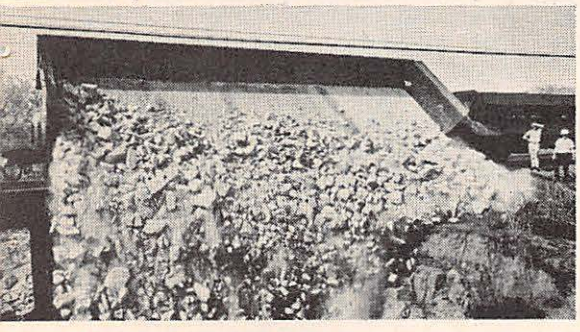
Q. What some people call the "sociology" of rapid transit—the effect on lower economic groups, real estate, rejuvenation of center cities, etc.—is all very complex. What are your views?

A. I said earlier that I believe good transportation is an absolutely vital element of a community. I couldn't emphasize that too strongly. I believe that this transportation system will make this city—the downtown of this city—once more a live center of human attraction, human activity, commercial activity, notwithstanding all we hear about the air-conditioned shopping centers in the suburbs, or the ease with which a person can park within 50 feet of the store he's going to. The suburban shopping center cuts the center of the market. If you want a variety of sizes, styles or colors, you have to come downtown. As soon as the transportation into downtown is improved, that advantage is itself going to be enhanced because the department store downtown will become more aggressive. So far as other sociological aspects are concerned, I believe the improvement in employment opportunities will be very significant. It means that the man in town can go out to the suburbs for a job. The man in the suburbs can, of course, come to work more readily. I think it's going to restore the ebb and flow of human association and human movement on pretty much the basis that this vast metropolitan area will once more be thought of as a city. ■

FRISCO "SHORTSTOPS" MAINTENANCE OF WAY



WITH DIFCO AIR DUMP CARS*



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D711

WEICKER:
"The railroad will come roaring back"

Senator Lowell P. Weicker (R.-Conn.) comes from a section of the country that has long been acutely aware of railroad problems. Last summer, railroads became acutely aware of Senator Weicker when he startled a Senate hearing room by inquiring of then-DOT Secretary John A. Volpe: "Haven't we come to the point where we need to nationalize the railroads?" (RA, Aug. 14, 1972, p. 5). Weicker's subsequent legislative activity has suggested that the question was more rhetorical than otherwise. He is the sponsor or co-sponsor of several railroad-related bills now pending in Congress. Railway Age Associate Editor Ronald Fry recently talked with Senator Weicker about some of these bills and their implications.

"I don't believe in nationalization: the government has enough trouble running the government."

—Sen. Lowell Weicker (R.-Conn.)

Q. What is the thinking behind the so-called Hartke-Weicker bill, the "Spirit of '76 High Speed Rail Act"?

A. We want to considerably upgrade the outlays for both research and development and capital improvements in the Northeast Corridor. This legislation, as you know, will provide another $225 million to Amtrak in extended loan guarantees and authorize $400 million for necessary upgrading and design under the direction of the Army Corps of Engineers.

Given the necessary funding, Amtrak can live, and live in very healthy fashion. But if you bequeath it just enough to cover operating deficits, you might as well seal its coffin. All of the old cars, old tracks, old roadbeds and old concepts are not going to break the cycle that we now have.

Q. Does this legislation have implications outside of the East?

A. Yes. It dramatizes the lack of a good rail system in this country and the over-all rail quality. This bill, if it just gets the public's attention and gets them thinking about rail transportation, will have performed a significant task.

This bill will hopefully make the public realize that (1) they need rail systems and (2) just as importantly, these systems can't do today's job with yesterday's equipment.

Q. In addition to equipment, there's the problem of rights-of-way.

A. I'd like to see the Federal government take over all rights-of-way of all railroads. This would give railroads the type of support that has always been given highways and, to a great degree, the airlines. The government would then be responsible for maintenance, just as if the roadbed were a highway or an airport. It would give the people of the United States a sum certain as to what the public obligations to the railroads would be and end the wildly fluctuating, crisis-oriented methods of emergency funding. It would give us a hold on upgrading service and free the railroads to spend more money on capital improvements and R&D.

Q. Wouldn't this be close to nationalization?

A. The government wouldn't be operating the railroads at all. They'd simply own the right-of-way the same way they own the highways. I don't believe in nationalization: the government has enough trouble running the government. Adding railroads to their headaches wouldn't, I should think, help the situation at all.

Q. You are also co-sponsor of a bill to create a new "Northeast Rail Line Corporation." This means that you reject the Penn Central trustees' proposal for subsidy?

A. Yes. Of the three proposals the trustees have come up with [RA, Feb. 12, p. 10] my own proposal is very similar to their second alternative—quasi-nationalization. We can't just come up with another stop-gap solution.

Q. How importantly do environmental factors figure in the rising emphasis both on upgrading railroads and improving mass transit?

A. In terms of energy consumption, pollution, safety and land-use, railroads and mass transit come out above highways. In Connecticut, for example, we simply don't have any more space to build highways. We're constantly accused of forcing mass transit on everybody through such proposals as Hartke-Weicker or Kennedy-Weicker. That's just not the case. We want to give people a choice. Right now, you've got highways and airports. That's it, and that's not much of a choice.

I'm really amazed how much we are willing to suffer for the pride of ownership of one or two automobiles. We'll sit for several hours in a traffic jam, breathing filthy air, maybe get injured, or at least creased, and then go home to prepare for the same horror show the next day. We've become a nation of automotive lemmings, ready to drive ourselves over a cliff.

Q. How would the Kennedy-Weicker bill affect current funding for mass transit?

A. The "Highways and Related Transportation Systems Improvement Act of 1973" would crack open the Highway Trust Fund for mass transit. An estimated $3.25 billion would be left untouched, to be allocated for the Interstate system. But the $2.75 billion allocated for non-Interstate funding could be used for mass transit. No one, of course, has to use these funds for mass transit, but at least the extremely diverse areas of this country will have an option to spend these funds on rail or bus transit. Half of this money will go to a state-level agency and the other half, under a so-called passthrough provision, will go directly to metropolitan areas.

Our transportation system has become an indifferent, inefficient, destructive and deadly beast of national burden. It goes where the spirit of speculation moves it—and it's driven by the wheels of vested interest. Since we have an opportunity, for once in our lives, to create a good transportation system, why don't we take a far-reaching step—take the Kennedy-Weicker bill—and be done with it. If you accept the concept behind the arguments for more balanced transportation, you accept the concept behind this bill. The only problem is the money. I'm afraid this is going to come in bits and pieces, no matter how hard we fight, yet I know our day has come. I know that mass transit is going to become as big an issue as the environment ever was.

The railroad is going to come roaring back. ■

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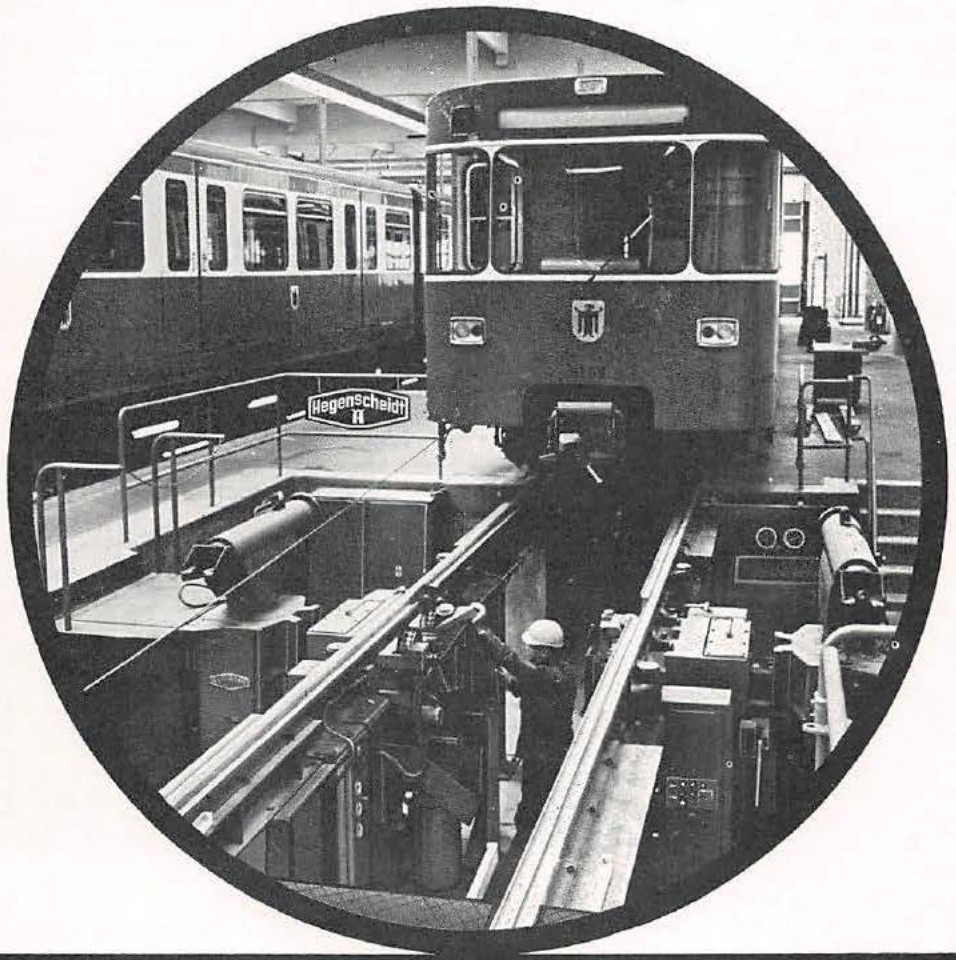

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MoPac expands training-by-video

Ask a railroad offficer or supervisor to rank the day-to-day problems he faces, and almost without exception he'll put a one-word answer—training—high on the list. The search for better training tools and techniques and methods is a continuing one, probably an endless one. But training breakthroughs can be made—and Missouri Pacific has made one, in setting up an in-house television production facility with full-color capability. A number of other roads are also using tv. But nobody, it would appear, has gone farther faster than MoPac.

Don Manion, Guerdon Sines and Harris Ducote are agreed: Television training is helpful, effective, efficient. Manion is vice president-operations at MoPac, Sines is director-information and control systems, Ducote is manager-sales training. And their comments on television's impact are just one measure of the contribution being made by the railroad's video training section. Operations, information systems and sales departments are all benefitting—and it's only a beginning: Last year, in its first year of operation, MoPac's in-house facility turned out 17 productions—but it's now producing films at a rate of one a week.

● **Why television works.** Television, MoPac points out, has a lot going for it. It's a familiar thing, and familiarity seems to make it more effective as a training tool. It holds the attention of trainees. It's flexible, in its use by individual trainees. For example, rules-and-safety supervisors used to have trouble holding class attention during training sessions which made use of such conventional visual aids as slides and flip charts. With tv, this is no longer a problem. Computer programmers used to spend a month in classroom study of the computer language RAIL. Now, they learn at their own speed—but more quickly—through use of a multi-media teaching program. Switchmen and carmen used to learn their duties by watching how the old heads did the job. Now, they view a series of videotapes and become fully familiar with proper safety and work methods before they even see a yard or shop. Sales training has been improved because salesmen now can practice their technique before the camera—and then review how the "sales call" went.

In the operating area, MoPac has produced six tapes, ranging in length from 7.5 to 37 minutes. "Hand Signals" tells what they are, what they mean, how to give them, and emphasizes the need for standardization in hand-signal methods. "Handling Switches" goes into descriptions and terminology, emphasizes the right way to operate switches and also shows what can happen if a switch is handled improperly. "Moving Equipment" illustrates the proper techniques for getting on and off moving cars, how to ride cars safely and how to set hand brakes. "Precautions in Switching" covers proper procedures in flat-yard movement of cars from track to track. "Duties of a Carman" covers such subjects as safety in the shop and in yards, how to change brakeshoes and air hoses, how to jack cars and how to work with air under high pressure. "Interlockings," longest production in the series, uses three tapes: (1) The working of interlock equipment and the rules governing movement; (2) detailed instruction on approach orders; and (3) stop orders.

And Don Manion's opinion of tv's worth? "I'm all for it. It allows us to get more information to more people in a highly usable form. The films we now have are good and very helpful, but they're only a beginning. Eventually, we hope to extend video films to cover many more operations. The ultimate goal is not only to provide better training but also to achieve standardized work practices throughout the system. We want to show our people through these presentations the best way to do a specific job, and then we want everyone to do the job just that way across the board. That way, we'll achieve far more efficiency in every aspect of operations."

● **TV tackles RAIL.** At this point, perhaps the most advanced use of tv learning techniques, however, is in the information and control systems area. Computer programmers coming to MoPac often must learn a new language, since several symbol languages are in use in the data-processing field. At MoPac, the language is RAIL—and in the past, groups of programmers would be taken off the job for a month of classroom training, in which there was little opportunity to go back over subject matter

program

MOPAC'S VIDEO EQUIPMENT is normally housed in a studio at St. Louis headquarters. The studio can be quickly dismantled and transferred to a van. Below, Supervisor Jerry Tapley and his assistant, Marsha Wilson, dub sound onto a video track.

MULTI-MEDIA TRAINING helps programmers learn computer language quickly. Brenda Pierce, coordinator for programming training, has a choice of textbook, audio cartridge or videotape, and uses all three.

imperfectly understood. Now, MoPac programmers use a special study carrell—a kind of soundproof isolation booth—and learn through videotape presentations, audio cassettes and textbook readings. For example, a student in the carrell may watch videotape for 10 or 12 minutes. Then the screen goes dark and the student is told to turn to a passage in the textbook. When he finishes that, he's instructed to listen to a tape recording. At the end of the tape recording, he might be directed back to videotape. The use of multiple media breaks up the monotony and keeps the student interested—and the control system permits him to replay material which he might not have fully understood the first time around.

Thus far, four RAIL videotapes have been completed and seven more are scheduled for completion this month.

In the same general area of systems, MoPac is also using videotape to instruct employees as various phases of its complex Transportation Control System go into operation. Emphasis is placed on how to input data in new forms into the management-information system, on how to prepare the documents used in TCS and on the relevance of the changes being made. Traveling instructors, equipped with playback units, are thus able to teach employees in groups, answer questions and save a great deal of time that might otherwise be spent in individual instruction.

Guerdon Sines calls the videotapes "very helpful in that they permit us to condense information for study. We are able to make more efficient use of our instructors." The self-study system for RAIL, he points out, "permits the programmer to advance at his or her own speed—where in a classroom situation, the instructor must keep the pace down to the level of the slowest student. The tapes are also effective as an aid to the instructors who work with employees in the field. They're not a total substitute for personal instruction, but they are a highly useful training tool."

● **Better letters, too.** Still other videotape uses are in employee orientation and in improving communication. Three orientation productions have been prepared, one designed for operating employees, another for data-science technicians and the third for employees in other departments as well as for prospective employees who are being contacted through MoPac's college/university recruiting programs. The "communication" tape is a 35-minute presentation, "Better Letter Writing," designed for both the secretary and the supervisor. Topics covered include proper dictation methods, how to achieve brevity and clarity and avoid stuffiness, how the secretary can help to improve letters and how the supervisor and secretary might work together more efficiently.

In sales training, the use of tv is a bit different. Here, the sales training staff has a black-and-white closed-circuit tv system used to help MoPac salesmen see themselves as others see them. At least once during every sales training seminar, every salesman attending makes a sales presentation to a member of the training team—and then he watches an instant replay. First, he's given opportunity to evaluate his own efforts, then the trainer runs through the presentation with him.

Says Harris Ducote: "Beyond any doubt, television has been an effective training aid for us. We can talk all we want about effective personal sales presentation—but it's no substitute for the man actually seeing himself and evaluating his own efforts."

Television, of course, is just one of many facets of MoPac training/education. The road also utilizes a variety of college offerings and outside seminars, as well as encouraging employees to pursue higher education on their own through the company's tuition-aid and fellowship programs. At MoPac, employee training may range from a one-day, on-the-job short course to three years of full-time college study paid for by the company.

● **From "home movies" to...** Television came on the scene about two years ago—with use of comparatively crude black-and-white equipment. And while these tv productions were helpful, they lacked true professional quality—and were, as one observer put it, "more like home movies." Early last year, the decision was made to acquire high-quality equipment and establish full-color production facilities—a decision which, MoPac notes, has made it the first railroad to do this and one of the first companies in the nation to make such an investment. Now, the road has equipment which meets commercial television standards, including two color cameras, three master tape recorders, a special-effects generator, switching and editing equipment, a stereo sound system, broadcast turntable, mikes, amplifiers, film chain projector plus pulse, sync and distribution generators as well as lights, cables and other hardware.

The equipment is housed in a special studio at MoPac headquarters in St. Louis—but it can quickly (in less than two hours) be loaded into a van for field shooting and production: Every item finally selected for the studio was first field-tested to determine whether it could function under adverse, outdoor conditions.

The video training section is headed by Supervisor Jerry Tapley and his assistant, Marsha Wilson—both hired from the outside and both with commercial tv experience. Their efforts are supplemented by those of other railroad personnel who prepare scripts, do the narrating and act as technical advisors. Thus, MoPac has a blend of television professionalism with solid railroad experience in developing its tv capabilities. And the technique itself permits use of experienced railroad officers as instructors: One taped presentation can reach many trainees—and conserve the time of top officers and supervisors.

MoPac says that a number of roads have indicated interest in tv training—and as a result, the road is offering its videotapes "at a nominal price to any railroad that can use them," with details available from William E. Gruer, manager-personnel planning. ■

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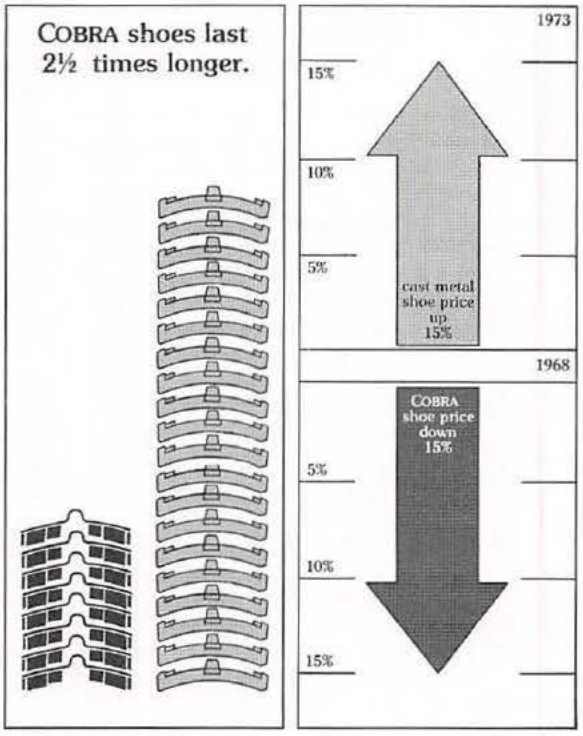

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Since 1968 cast metal shoe prices have gone up over 15%. In that same period, COBRA brake shoes have come down in price—more than 15%! Research and manufacturing innovations in the past five years have increased COBRA quality and performance while reducing production costs. More importantly, the reduction in cost has been passed right on to our customers, the railroads.

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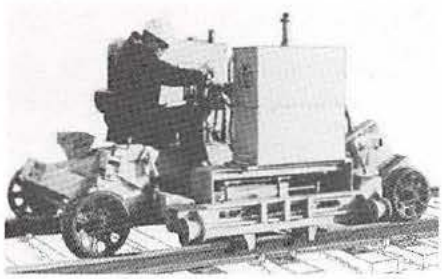
Circle 18 on coupon page 45

New Products Report



Rail anchors are correctly positioned against the ties

A new machine for adjusting or positioning rail anchors is being produced by Railway Maintenance Corp. Using independent hydraulic workheads at each rail, the machine applies eight tons of force to move the anchor to correct position tight against the tie.

The RMC Anchor Adjuster can be used with all makes of standard rail anchors. Neither anchors nor rails are damaged by the even application of pressure to effect the movement of the anchor.

Operating at a rate of 8 to 9 ties per minute, the Anchor Adjuster is designed to work independently. It is fast enough to follow a tandem tamping operation, it is said.

The workheads penetrate normal ballast conditions, with no cribbing necessary. The manufacturer recommends the machine for adjusting the location of badly-applied anchors and for correcting bad anchor conditions caused by rail movement and mechanical wear of tie-bearing surfaces.

Circle 60 on reader service card

New machine nips ties and drives pre-set track spikes

A new rotary single-head spike driver for fast, efficient insertion of spikes, is available from Jackson Railroad Equipment Co. The new machine is said to drive two pre-set spikes per tie at the rate of four ties per minute.

The unit incorporates four independently driven rotating spuds in its press head, which bore down on each side of the rail through even the most compacted ballast. When the press head is down, the spuds stop rotating and clamp the tie securely, while the two spikes are driven hydraulically. Overdriving is eliminated by the use of controlled hydraulic pressure.

The machine is one-man operated, self-propelled with manual hydraulic controls and has a travel speed up to 20 mph. A hydraulically powered turntable fitted beneath the machine permits rapid reversing so that both sides of the track can be worked section by section.

The spike driver is powered by a Wisconsin 18-hp engine and a Vickers hydraulic pump. It has an all-steel frame and heavy-duty equipment for dependable operation and minimum maintenance.

Circle 61 on reader service card

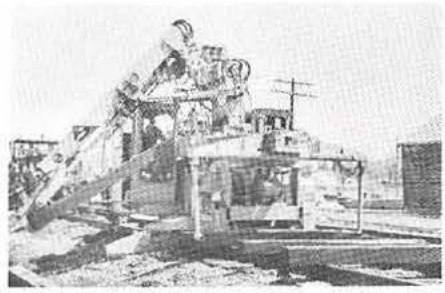
Spreader/ditcher can now be hauled in revenue trains

The Jordan Co. has introduced important modifications in the Model 4-100 Spreader/Ditcher/Snowplow which will permit transfer of the unit in revenue trains at speeds up to 60 mph. Three of the modified units are being produced for Canadian National.

The changes consist of a new truck suspension system plus Unity no-sway side-bearing stablizers. The modifications were designed to CN specifications in conjunction with Jordan's engineering department.

Traditionally, the Jordan units have been moved as a piece of work equipment at speeds of 10 to 30 mph. The design improvements, which double the speed capabilities, will provide CN with the fastest utilization of the equipment for emergency snow and ice removal or other M/W problems. The faster movement of trains should result in greater economy, stricter adherence to schedules, reduced chance of perishable-goods spoilage and increased benefit to shippers.

Circle 62 on reader service card



Crossties go in fast with new scarifier-inserter

A new One-Man Scarifier Inserter (OMSI) has been developed by the Nordberg Railway Equipment Division of Rexnord, Inc., to speed the production of tie-renewal gangs. The OMSI selects ties, scarifies the tie bed and inserts the ties squarely with the rails ready for plating and spiking in one operation. Positioned behind the tie-removal operation, the manufacturer

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states that OMSI will install ties at the rate of 200 ties per hour.

The ties are placed on the rails ahead of the machines. As it approaches the ties, they are lined up by arms extending over each rail. A nipper on the end of the booms grasps the tie squarely and securely and the boom moves out to the side to position the tie for insertion.

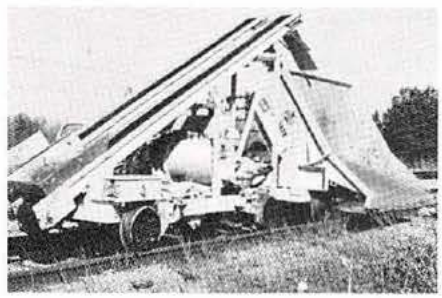
As the boom is being positioned, the scarifying blades drop into the ballast and clear the bed to the proper depth. If the scarifying assembly goes too deep, it will be retracted to the proper depth before opening for tie insertion. This controlled depth of the scarifying blades means minimum tie-bed disturbance.

The boom inserts the ties traveling downward in a curved path, then rams the tie straight home. This feature permits its use in mimimum-clearance locations where the distance between tracks prevents a "straight-in" approach. The boom also pivots 180 degrees to allow the operator to insert ties from either side of the track.

After the tie is properly positioned square with the rails, it is released by the jaw. The boom moves out and forward to pick up the next tie, and the blades are retracted, allowing the ballast to fall back against the tie.

OMSI is powered by a GM 4-53 diesel engine delivering 87 hp at 1,800 rpm through a Vickers MPV8-45 hydraulic system pump of 44 gpm. The unit has an adjustable working speed of 0.14 mph.

Circle 63 on reader service card



Large loader will accept all scrap from welded-rail string

A heavy-duty Scrap Loader available from Railway Maintenance Corp. is for use with continuous rail-laying gangs. The new self-propelled unit has a 12,000-lb capacity compared with a 4,000-lb capacity available on standard models.

The design includes a 12,000-lb capacity dumping bin and a conveyor at each rail for conveying scrap to the dumping hopper. The scrap from a 1400-foot string of rail can be loaded into the hopper, as the scrap is removed. This eliminates expensive double handling of scrap. Construction includes heavier wheel-and-axle assemblies.

The standard scrap loader which provides separate 4,000-lb-capacity hoppers to permit economical loading where sorting is required also is available.

Circle 64 on reader service card

Three brushcutter models are for various cutting conditions

The Klearway Brush Cutter is available from Kershaw Manufacturing Co. in three different models to give a broader selection to meet the customers' requirements.

Model 10-3 has a 7-foot 4-inch cutting head and is equipped with 23.1 by 26 tires. Model 10-4 has a 10-foot cutting head and is equipped with 23.1 by 26 tires. For operating conditions that require maximum flotation and increased traction, Model 10-5 is offered with a 10-foot cutting head and is equipped with 67 by 34 by 25 Flo Grip Terra tires.

All models are completely hydraulic-operated with hydrostatic drive transmissions. This type of drive provides positive control of an infinitely-variable machine speed to 14 mph. Because the Klearway is completely hydraulic, the drive shafts, chains, pulleys, clutches and drive belts are eliminated for lower over-all maintenance costs.

Circle 65 on reader service card

An improved unit of the Tie Shear can now operate all day

Fairmount Railway Motors has introduced an improved series of its Tie Shear designated as W114 Series B. The new machine incorporates a number of improvements over the earlier Series A Tie Shear.

The frame has been strengthened and the front axle is now spring mounted. The air compressor is direct-driven off the engine with increased air operating pressure. Vickers piston pumps have been replaced with Vickers double-vane pumps and unloading valves. A single 65-gallon hydraulic oil reservoir with built-in strainer and filter, replaces the two smaller hydraulic reservoirs. The fuel tank has been relocated and its capacity increased to provide a full day's operating supply.

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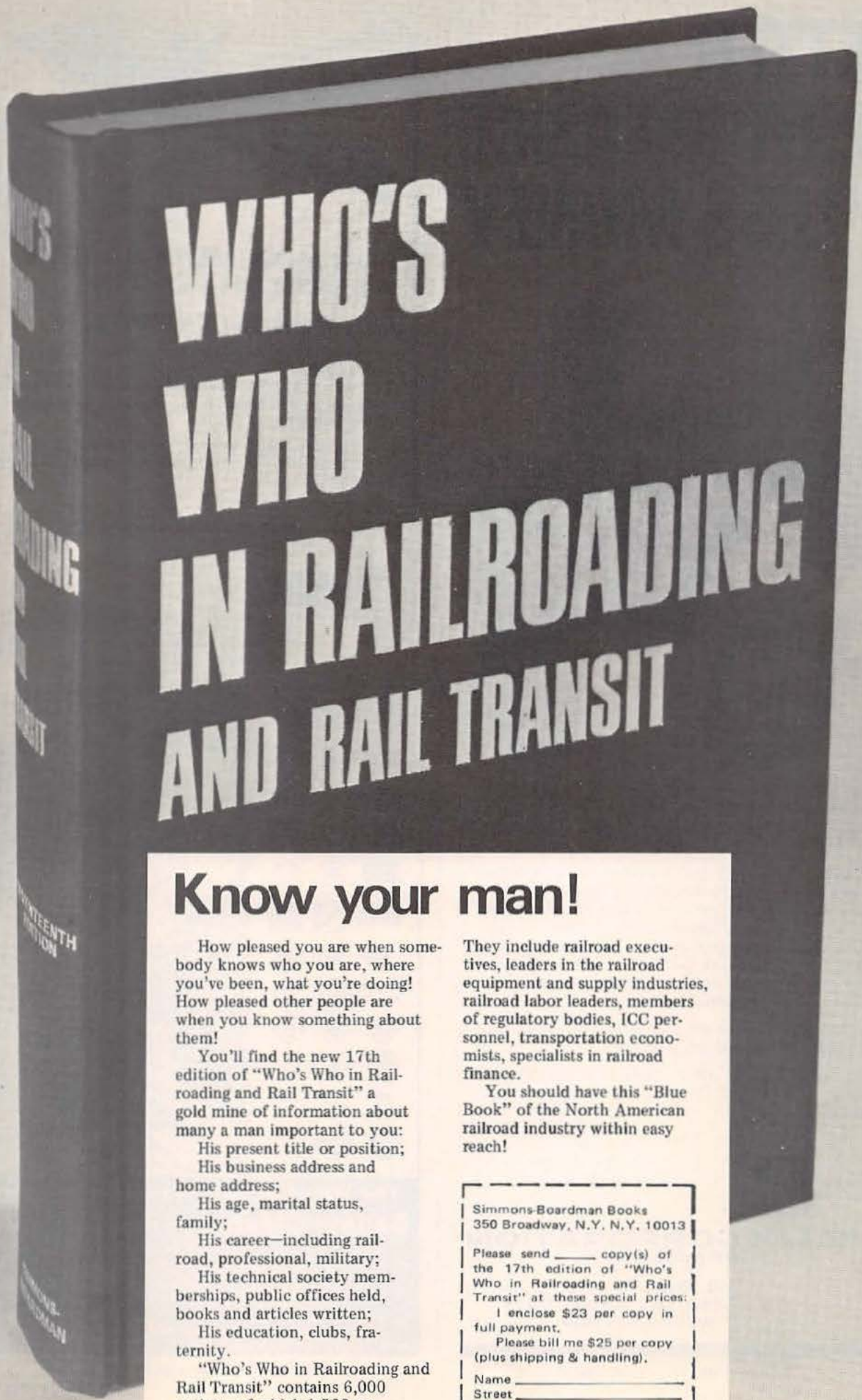

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Market Outlook

CARLOADINGS

Loadings of revenue freight in the week ended Feb. 24, which included the Washington's Birthday holiday, totaled 506,035 cars, according to the Association of American Railroads. This was an increase of 658 cars, or 0.1%, compared with the previous week, and an increase of 44,890 cars, or 9.7%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended Feb. 24 are estimated at 15.9 billion, an increase of 12.2% above the corresponding week of 1972.

REVENUE FREIGHT CARLOADINGS

Commodity	Feb. 24 week	Feb. 17 week
Grain	30,674	32,492
Farm products	14,181	13,283
Metallic ores	22,258	20,861
Coal	84,660	84,527
Crushed stone, gravel & sand	20,074	19,827
Nonmetallic minerals	9,992	8,900
Grain mill products	21,465	23,108
Food and kindred products	22,227	23,044
Primary forest products	26,143	23,614
Lumber & wood products (except furniture)	16,890	16,982
Pulp, paper & allied products	23,620	23,027
Chemicals & allied products	29,300	28,570
Petroleum products	9,851	10,459
Stone, clay & glass products	18,852	18,560
Coke	7,948	7,341
Metals & products	27,067	26,989
Motor vehicles & equipment	28,969	28,899
Waste & scrap materials	15,903	16,914
Forwarder & shipper assn. traffic	6,605	7,144
All other carloads	68,960	70,853
LCL traffic	396	398
Total cars loaded	**506,035**	**505,792**
Cumulative total, 8 weeks	1973	1972
	3,957,743	3,683,045
Estimated revenue ton-miles billions 8 weeks	123.6	111.8

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week ended Feb. 17 totaled 29,430 cars (20.4% above the corresponding week last year) and 50,152 trailers or containers (up 21.9% from 1972). Cumulative volume for the first 7 weeks of 1973 is 187,591 cars (up 17.1% from last year) and 320,411 trailers or containers (up 20.2% from 1972).

IN CANADA

7 days ending	Tons of Revenue Freight	Cumulative Totals
Feb. 14, 1973	3,947,401	25,617,959
Feb. 14, 1972	3,567,471	21,474,888

● *Norfolk & Western.*—Ordered 1,000 100-ton jumbo covered hoppers from its Roanoke, Va., shops at a cost of $18.1 million.

● *Rock Island.*—Ordered 1,200 cars at a cost of $21.2 million. Pullman-Standard will build 500 100-ton jumbo covered hoppers; 450 50-ft, 70-ton general-purpose box cars and 100 60-ft specialized box cars with lading-protection devices. Thrall will build 150 52-ft 100-ton gondolas. Deliveries begin in April.

● *Trailer Train.*—Ordered 1,460 89-ft 4-in. flat cars as follows: from ACF, 250; Bethlehem Steel, 797; Pullman-Standard, 413. All will be standard-level cars, except for 213 low-level cars ordered from P-S. As of Feb. 23, TTX had 63,365 cars in service or on order.

● *Freight-car orders and deliveries.*—The following report has been received from the AAR and ARCI:

DELIVERED

	Jan. 1973	Dec. 1972	Jan. 1972
Built new by carbuilders	4,536	3,830	3,965
Built new in R.R. shops	246	239	246
Built new—total	4,782	4,069	4,211
Rebuilt	317	285	328
TOTAL DELIVERED	**5,099**	**4,354**	**4,539**

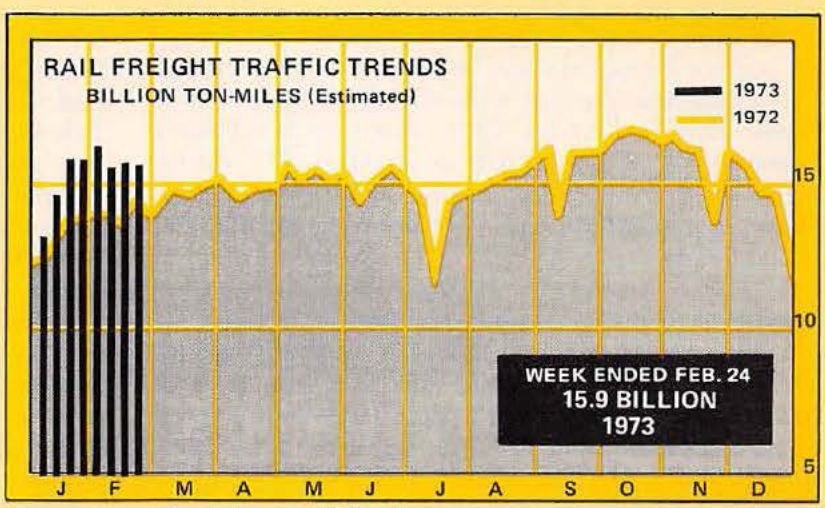
ORDERED

To be built new by carbuilders	5,084	4,708	2,320
To be built new in R.R. shops	341	17	1,460
To be built new—total	5,425	4,725	3,780
To be rebuilt	-598*	0	375
TOTAL ORDERED	**4,827**	**4,725**	**4,155**

ON ORDER AND UNDELIVERED

	Feb. 1, '73	Jan. 1, '73	Feb. 1, '72
To be built new by carbuilders	18,610	17,666	17,183
To be built new in R.R. shops	3,673	3,578	4,682
To be built new—total	22,283	21,244	21,865
To be rebuilt	675	1,590	1,833
TOTAL ON ORDER	**22,958**	**22,834**	**23,698**

*Previously placed orders cancelled.



Source: Association of American Railroads

Moving People

BALTIMORE'S NEW TARGET DATE: 1980

Major construction will begin early in 1974 on Baltimore's first rapid transit line, but it won't be ready for revenue service before 1980, State Secretary of Transportation Harry R. Hughes has informed the Maryland legislature. The hoped-for 1978 opening date proved to be unrealistic, he said. The initial 28-mile line will extend from Owings Mills in Baltimore county through the downtown area to Marley in Anne Arundel county. There will be a spur to Friendship International Airport. First-phase cost is estimated at $656 million, with the state supplying $219 million from a gasoline tax approved by the legislature last year.

CAPITAL GRANT REQUESTS PILE UP AT UMTA

UMTA's capital grant program in fiscal 1974 will obligate $872 million, only a slight increase from '73's $864 million. This will assist in purchase of 215 commuter rail cars and 275 rail rapid cars, but, complains the National League of Cities, must be measured against more than $4 billion in unfunded applications, of which about $2 billion are ready for immediate funding.

HOUSE GIVES TRANSIT ITS OWN SUBCOMMITTEE

Urban transit legislation in the generally pro-highway House got a boost when Democrats on the House Banking and Currency Committee voted to create a separate Mass Transit Subcommittee. In past Congresses, transit legislation has been handled by that committee's Housing Subcommittee. Rep. Joseph G. Minish (D.-N.J.), who has sponsored bills for Federal operating subsidies to transit authorities, was named chairman of the new unit.

PARIS PLANS TRANSPORT-EXPO IN JUNE

Transport-Expo, described as "the first international exhibition devoted to the most advanced technology in surface transportation, as well as novel methods for exploiting classical technology," will be held in Paris June 4-8 under sponsorship of the French government. A concurrent conference will feature speakers from several countries. Inquiries should be directed to Technoexpo, 8 Rue de la Michodiere, 75002-Paris.

VIRGINIA REJECTS TRANSIT-AID TAX

A Virginia House of Delegates committee has overwhelmingly defeated a bill that would have helped finance mass transit projects by doubling the state's present 2% auto title tax. The action followed the earlier defeat of a proposal to create a state department of transportation. Virginia Highway Commissioner Douglas Fugate said his agency could easily oversee state aid to mass transit. Fugate also opposed environmental impact statements because "they simply arm dissenters with the means to initiate court action and without penalty to themselves delay indefinitely highway projects desired by an overwhelming. . .silent majority."

ENGINEERING TEST PROGRAM FOR SOAC

A $496,000 contract covering systematic engineering tests of performance of the pair of State-of-the-Art (SOAC) transit vehicles (RA, Jan. 8, p. 17) has been awarded to the Boeing Vertol Surface Transportation Systems Department by the Transportation Systems Center (TSC) at Cambridge, Mass. TSC is systems manager for UMTA's Rail Supporting Technology program. Boeing Vertol is systems manager for SOAC test and demonstration which is sponsored by UMTA's Rapid Rail Program. An instrument and data recording package will be developed for appraising vibration levels, truck structural behavior, rail adhesion characteristics and behavior of resilient wheels. Baseline data is to be collected at the DOT High Speed Ground Test Center at Pueblo, Colo., and then testing will be conducted during revenue demonstrations in New York, Philadelphia, Boston, Cleveland and Chicago.

SEPTA AIMS TO RESUME HELICOPTER PATROL

Success of FRA-sponsored helicopter patrols in reducing vandalism along Penn Central and Reading commuter lines out of Philadelphia during 1971 has caused Southeastern Pennsylvania Transportation Authority to apply to the Commonwealth of Pennsylvania for funding to resume this surveillence. The patrols would resume in April if the $30,000 program gets a go-ahead from the state.

TORONTO SUBWAY RIDERSHIP UP

If you build a better transit system, will riders really beat a path to your door? The experience of Toronto Transit Commission continues to suggest that the answer is strongly affirmative. In 1972, reports TTC, the number of persons using the subway on a typical business day climbed to 592,000—an increase of 30,000 over 1971. Altogether, the TTC—which also operates an extensive bus and streetcar system—collected 345,994,178 fares in 1972, an increase of 15,498,728 over 1971. Total system riding was 75 million higher than 10 years ago. In all, TTC now operates 626.5 route miles. The miles of service operated by the Commission in 1972 increased by 1,254,895 to a new high of 73.6 million.

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SUPPLY TRADE

George R. Grinton, vice president sales, **Tamper,** West Columbia, S.C., has been appointed vice president. **Arnold F. Bygate,** export sales manager, has been appointed general sales manager, with responsibilities for all domestic and export sales.

Joseph Jaremko has been appointed general manager, Car Repair Division, **Jordon Co.,** East Chicago, Ind.

Jerry L. Solomonson, assistant vice president-sales, **United States Railway Equipment Co.,** has been named director of technical services.

Neil G. Johnson, marketing manager-midwest, **Pullman Transport Leasing Co.,** has been elected assistant vice president-sales.

Donald Taylor has been elected president, **Nordberg Machinery Group,** and vice president-operations, **Rexnord, Inc.,** Milwaukee, Wis., succeeding **C.W. Foster,** retired. **Rex Chainbelt Inc.** adopted the named Rexnord on Jan. 24.

George S. Hale has been named marketing representative to railroads in the western United States for the **Transportation Systems Division, Vapor Corp.**

TRANSIT

Kenneth G. Knight has been appointed general manager of rapid transit construction, **Niagara Frontier Transportation Authority.** In this capacity Mr. Knight will lead the engineering design and construction for Buffalo's Metro Rapid Transit system. Mr. Knight was formerly assistant vice president, **DeLeuw Cather & Co.**

Simon Zweighaft, NFTA's engineer-planner, has been promoted to assistant general manager of rapid transit construction. He will assist Mr. Knight in managing the preliminary design activity for the planned Buffalo-Amherst rapid transit line. Mr. Zweighaft will also be manager of supplemental studies concerning vibration, noise, and possible electronic interference.

Frank W. Hearne has been named the first director of rapid transit development, **Mass Transit Administration, Maryland Department of Transportation.** He will be responsible for the overall management of planning, design construction and route development for Baltimore's Phase 1 rapid transit system. Mr. Hearne was formerly assistant director of engineering and construction, BART System, San Francisco.

G. Gordon Hurlburt elected vice chairman, **Toronto Transit Commission. Karl L. Mallette** and **Paul Godfrey** appointed commissioners.

Donald F. Valtman, manager of operations, **Cleveland Transit System,** has been appointed assistant general manager for transit operations, **Metropolitan Atlanta Rapid Transit Authority. James H. Huggins,** director of maintenance for MARTA will continue as acting assistant general manager until Mr. Valtman assumes his new position April 16.

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Col. Irving H. Breslauer, director of information, Military Airlift Command, has been appointed director of community services, **Metropolitan Atlanta Rapid Transit Authority. King Elliott,** acting director of community services, has been appointed manager of media relations for MARTA.

OBITUARY

Patrick B. McGinnis, 68, former president, **Boston & Maine,** died Feb. 21 at Cincinnati, Ohio.

Henry E. Mogler, who retired in 1966 as general passenger agent, **Southern Pacific,** San Francisco, died Jan. 21.

Hugh D. Richardson, 76, retired sales representative, **Pullman-Standard,** died Jan. 25 in Michigan City, Ind.

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Viewpoint

Let's keep our rights-of-way

The railroads' greatest single asset most certainly must be their private rights-of-way.

These rights-of-way—linear real estate—can be leased for overhead power transmission lines, parallel pipe lines or underground cable for power transmission, cable TV, etc. Properties can be doubledecked for other transportation modes. Air rights can be sold in areas where real estate is of prime value. None of these augmented uses affects the use of the property by the railroad owners for transportation purposes.

If these rights-of-way become publicly owned the carriers attain a status not much more favorable than that which the Railway Express Agency had—a carrier without the right to determine schedules or service and no assets except vehicles.

Once rights-of-way are publicly owned they will have to be made available equally to all users who qualify (if for hire, they would need to hold a certificate of convenience and necessity; or if private carriers, they would only have to meet Federal safety requirements). One major utility, for example, which already owns or leases cars and locomotives, could operate its trains over such rights-of-way. Instead of paying the established tariff to the railroad, they would need only to pay a per-train or per-car mile rate for trackage, and presumably reimburse the railroad for providing qualified union labor, or hire the labor direct from the seniority rosters.

Railroads would lose all rights to determine schedule priorities. The owners of the track, for example, could give priority to passenger train operators—in many cases more than one, relegating freight service to track space available and perhaps even nighttime operations only.

Suppose, for instance, that Amtrak decided to put Metroliners on a half-hour basis. In the Philadelphia area—Wilmington, Del. through Trenton, N.J.—SEPTA would be using the same trackage for fairly dense commuter services. Auto-Train would have the right to operate over this publicly owned track. Some 50 freight trains per day which Penn Central already has to squeeze into available slots would most certainly be relegated to nighttime operation only.

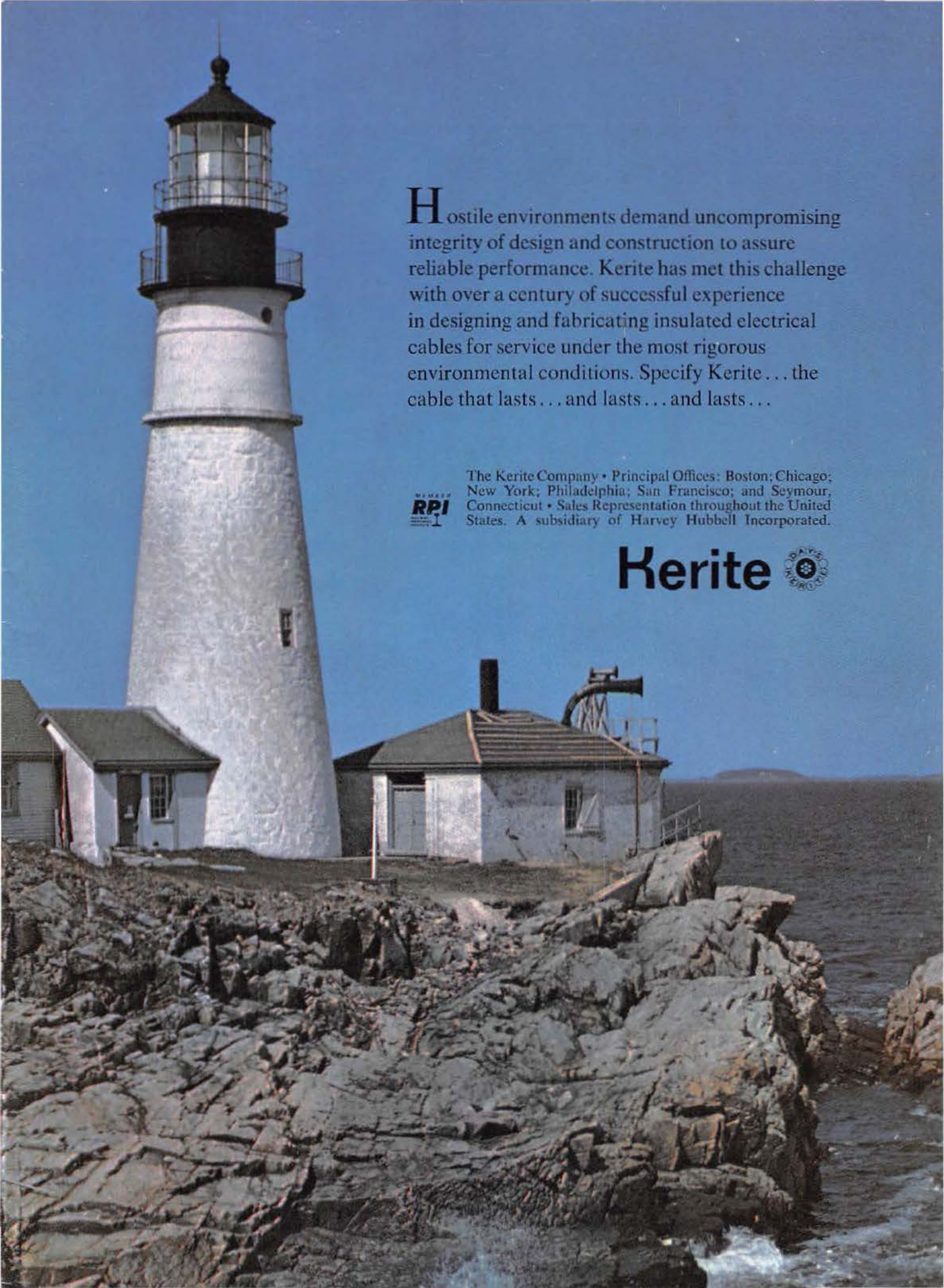
THERE IS A BETTER WAY

To repeat: one of the great remaining advantages the railroads still have is ownership of their rights-of-way and the prerogatives to operate them as they please; make them available to others as it is profitable, and maintain them to the standards they (and FRA) see fit.

The difficulty is, of course, the inequity vis-a-vis the competition, whose rights-of-way are provided by the public. ICC Vice Chairman W.D. Brewer recently commented, "During the past 15 years government spending at all levels on air, highway, and waterway traffic improvements amounted to about $250 billion. Spending totaled $25 billion in 1970. The railroads received only one-seventh of one percent of this amount, most of which was reimbursement for losses on commuter operations."

How can this inequity best be corrected? Since it is not desirable to put public money into railroad ownership the only logical way to achieve a balance is to charge the competition fully allocated costs through ton-mile taxes. If they could still price their services so as to be competitive with the railroads, then—and only then—should more drastic alternatives be considered.

—Robert G. Lewis



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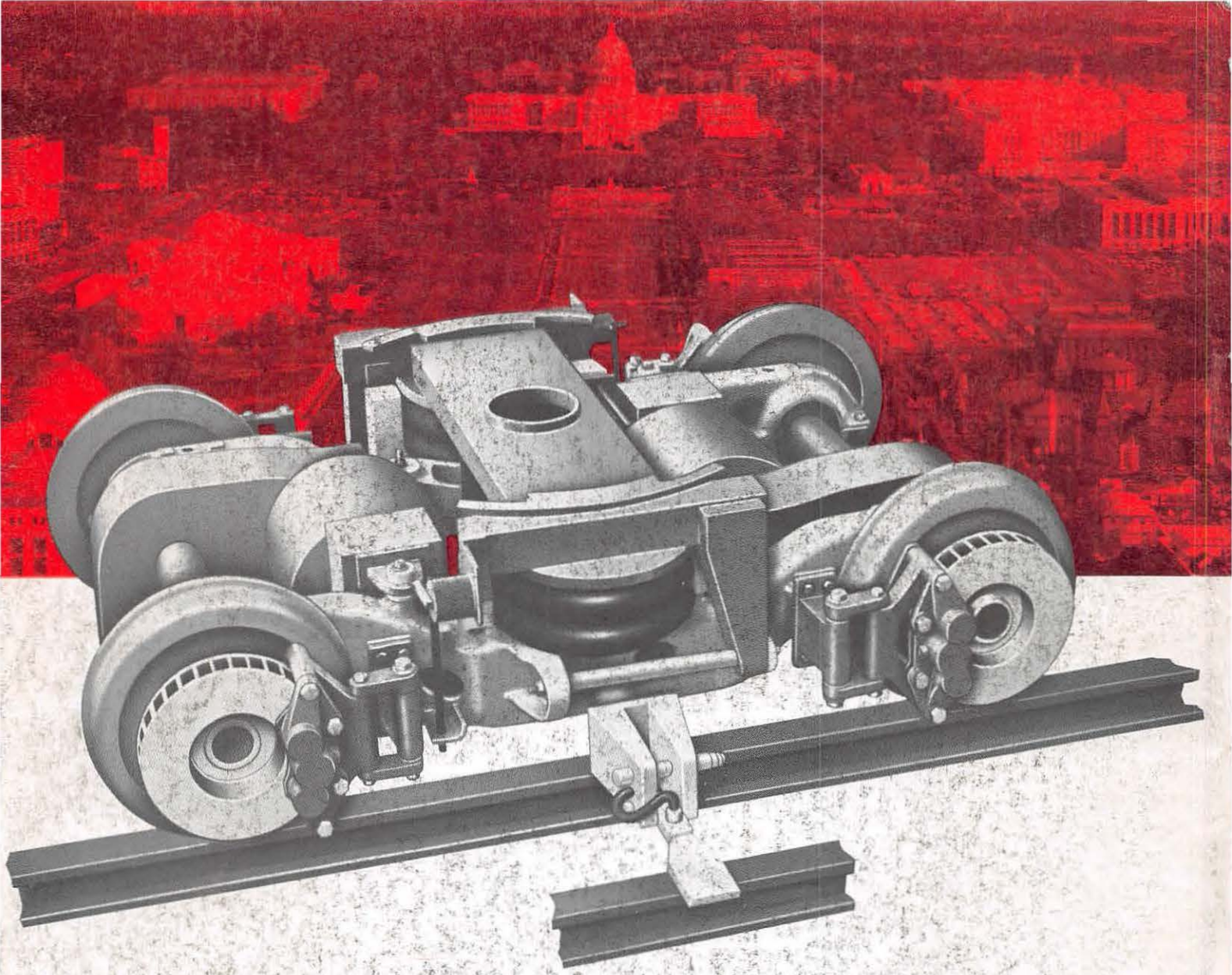

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